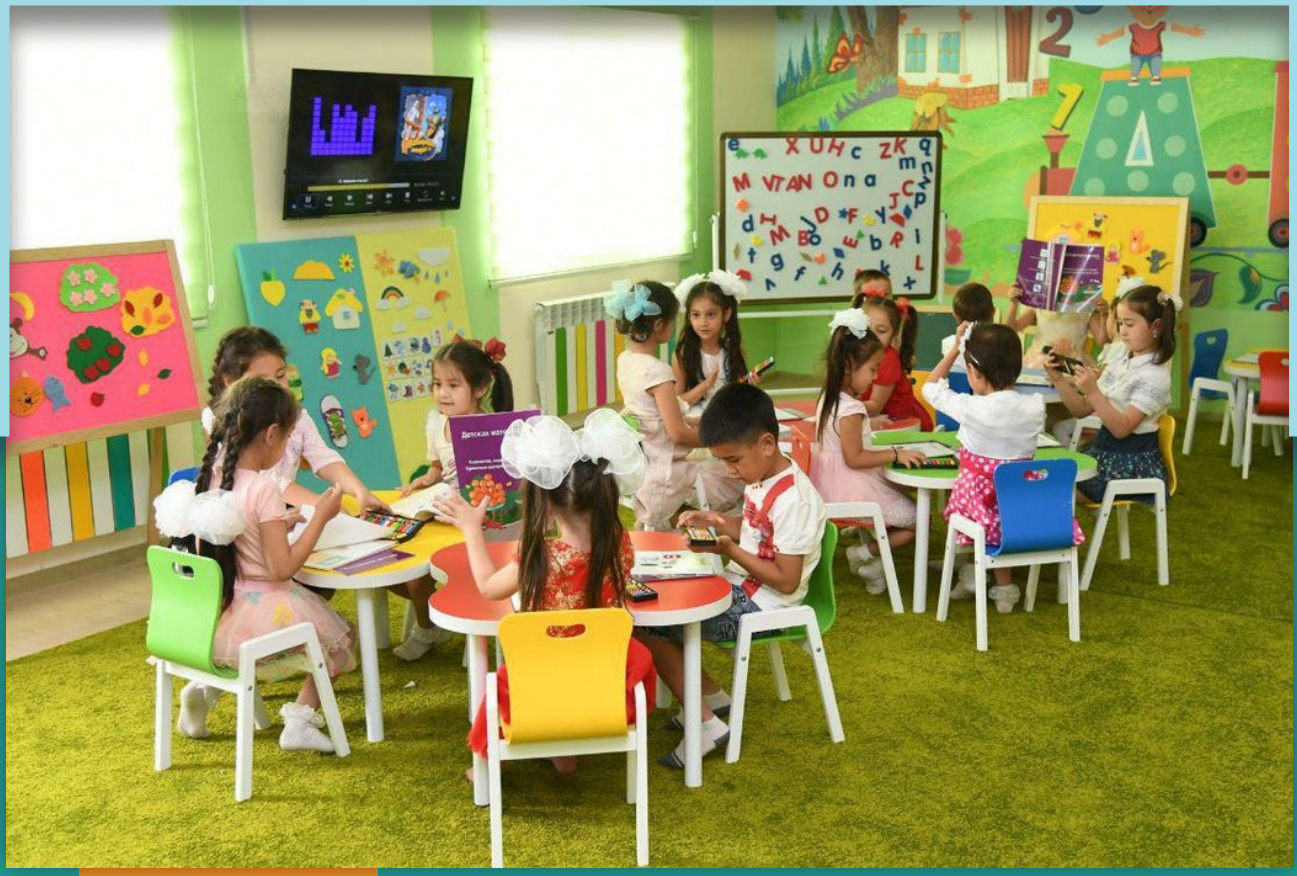
ISSN: 3060-4613

MAKTABGACHA VA MAKTAB TA'LIMI VAZIRLIGI

O'zbekiston Milliy Pedagogika Universiteti



№8(2)
2026

13.00.00 Pedagogika fanlari
13.00.01 Pedagogika nazariyasi. Pedagogik ta'limotlar tarixi
13.00.02 Ta'lim va tarbiya nazariyasi va metodikasi (sohalar bo'yicha)
13.00.03 Maxsus pedagogika
13.00.04 Jismoniy tarbiya va sport mashg'ulotlari nazariyasi va metodikasi
13.00.05 Kasb-hunar ta'limi nazariyasi va metodikasi
13.00.06 Elektron ta'lim nazariyasi va metodikasi (ta'lim sohalari va bosqichlari bo'yicha)
13.00.07 Ta'limda menejment
13.00.08 Maktabgacha ta'lim va tarbiya nazariyasi va metodikasi
13.00.09 Ijtimoiy pedagogika
07.00.00 Tarix fanlari
19.00.00 Psixologiya fanlari
01.00.00 Fizika-matematika fanlari
02.00.00 Kimyo fanlari
03.00.00 Biologiya fanlari
09.00.00 Falsafa fanlari
10.00.00 Filologiya fanlari
11.00.00 Geografiya fanlari

MAKTABGACHA VA MAKTAB TA'LIMI

Pedagogika, psixologiya fanlariga ixtisoslashgan ilmiy jurnal

MAKTABGACHA VA MAKTAB TA'LIMI

Elektron nashr. 140 sahifa,
12-avgust, 2026-yil.

Muassis: "Tadbirkor va ishbilarmon" MChJ
Hamkorlarimiz: O'zbekiston Respublikasi Maktabgacha va maktab ta'limi vazirligi, O'zbekiston milliy pedagogika universiteti

"Maktabgacha va maktab ta'limi" jurnali O'zbekiston Respublikasi Oliy attestatsiya komissiyasining quyidagi qarorlariga asosan pedagogika va psixologiya fanlari bo'yicha falsafa doktori (PhD) hamda fan doktori (DSc) ilmiy darajasiga talabgorlarning dissertatsiyalaridagi asosiy ilmiy natijalarni chop etish uchun milliy ilmiy nashrlar ro'yxatiga kiritilgan:
Pedagogika fanlari bo'yicha: OAK Kengashi tavsiyasi (26.08.2024-y., №11-05-4381/01) asosida:
• Ekspert kengashi (29.10.2024-y., №10)
• Rayosat qarori (31.10.2024-y., №363/5)
Psixologiya fanlari bo'yicha: Toshkent davlat pedagogika universiteti murojaatiga asosan OAK tavsiyasi (24.04.2025-y., №11-05-2566/01):
• Ekspert kengashi (25.05.2025-y., №10)
• Rayosat qarori (08.05.2025-y., №370/5)

"Maktabgacha va maktab ta'limi" jurnali

26.09.2023-yildan

O'zbekiston Respublikasi Prezidenti Administratsiyasi huzuridagi Axborot va ommaviy kommunikatsiyalar agentligi tomonidan **№C-5669363** reyestr raqami tartibi bo'yicha ro'yxatdan o'tkazilgan.

Litsenziya raqami: **№136361**

MUNDARIJA СОДЕРЖАНИЕ CONTENTS

MUNDARIJA

MUNDARIJA СОДЕРЖАНИЕ CONTENTS

THE ROLE OF NEUROMUSCULAR DENTISTRY IN DENTAL PRACTICE

Turayev Alimjan
Department of Pediatric Dentistry,
Samarkand State Medical University, Samarkand, Uzbekistan

Abstract: For contemporary dentistry, diagnosing and treating temporomandibular joint (TMJ) dysfunction and related chronic facial pain syndromes may be very difficult. Conventional isolated prosthodontic or orthodontic treatments often fail to provide long-lasting clinical improvements when underlying neuromuscular involvement and muscle hypertonicity are not addressed.

The goal is to assess the methods of diagnosis and treatment used in neuromuscular dentistry and to assess the clinical effectiveness of transcutaneous electrical nerve stimulation (TENS) and specially designed splint treatment in treating uncomfortable temporomandibular joint dysfunction conditions.

Supplies and Procedures: An empirical investigation of a typical clinical case served as the basis for the review of current academic research and clinical suggestions. A neuromuscular method was used to treat a 68-year-old female patient with chronic painful TMJ dysfunction syndrome, which included joint crepitus, limited mandibular mobility, anterior open bite, tinnitus, and severe recurring headaches. Transcutaneous Electrical Nerve Stimulation (TENS) and a particular lower-arch acrylic device ("Orthotic") were used as part of the treatment regimen to restore the normal mandibular position and the vertical dimension of occlusion (VDO).

Research Findings: TENS-induced targeted myorelaxation successfully reduced aberrant nociceptive pathways, eased spasms in the masticatory muscles, and allowed precise registration of the mandible's physiological neuromuscular position. For long-term therapy, orthotic splints were utilised to effectively stabilise occlusal contacts, eliminate joint noises and feelings of chronic pain, restore restricted jaw motions, and provide long-term functional stability without symptom recurrence.

Conclusion: Effective care of TMJ dysfunction requires a thorough multidisciplinary approach that concurrently takes into account the articular structures, occlusal connections, and the surrounding masticatory muscles. In challenging occlusal rehabilitation, the long-term prognosis and diagnostic accuracy are significantly enhanced with the use of contemporary neuromuscular modalities like TENS, particular orthotic appliances, and joint sonography.

Key words: masticatory muscle hypertonicity, orthotic appliance, occlusal rehabilitation, TENS treatment, neuromuscular dentistry, and TMJ disorders.

Annotatsiya: Zamonaviy stomatologiyada chakka-pastki jag‘ bo‘g‘imi (TMJ) disfunksiyasi va u bilan bog‘liq surunkali yuz og‘rig‘i sindromlarini tashxislash hamda davolash juda murakkab bo‘lishi mumkin. Asosiy nerv-mushak buzilishlari va mushaklar gipertonusi bartaraf etilmagan hollarda an’anaviy alohida ortopedik yoki ortodontik davolash usullari ko‘pincha uzoq muddatli klinik yaxshilanishni ta’minlamaydi.

Tadqiqotning maqsadi nerv-mushak stomatologiyasida qo‘llaniladigan diagnostika va davolash usullarini baholash, shuningdek, chakka-pastki jag‘ bo‘g‘imining og‘riqli disfunksiya holatlarini davolashda teri orqali elektr nerv stimulyatsiyasi (TENS) va maxsus ishlab chiqilgan shina terapiyasining klinik samaradorligini baholashdan iborat.

Materiallar va usullar: Tipik klinik holatning empirik tahlili zamonaviy ilmiy tadqiqotlar va klinik tavsiyalarni ko‘rib chiqish uchun asos bo‘lib xizmat qildi. Bo‘g‘im krepitatsiyasi, pastki jag‘ harakatchanligining cheklanishi, oldingi ochiq tishlov, quloqda shovqin va kuchli takrorlanuvchi bosh og‘riqlari bilan kechuvchi surunkali og‘riqli TMJ disfunksiyasi sindromiga ega 68 yoshli ayol bemorni davolashda nerv-mushak usulidan foydalanildi. Davolash rejimining bir qismi sifatida pastki jag‘ning normal holatini va okkluziyaning vertikal o‘lchamini (VDO) tiklash uchun teri orqali elektr nerv stimulyatsiyasi (TENS) va pastki tish qatori uchun maxsus akril qurilma (“Orthotic”) qo‘llanildi.

Tadqiqot natijalari: TENS yordamida amalga oshirilgan maqsadli miorelaksatsiya aberrant nositseptiv yo‘llarni muvaffaqiyatli kamaytirdi, chaynash mushaklaridagi spazmlarni yengillashtirdi va pastki jag‘ning fiziologik nerv-mushak holatini aniq qayd etish imkonini berdi. Uzoq muddatli terapiyada ortotik shinalardan foydalanish okkluzion kontaktlarni samarali barqarorlashtirish, bo‘g‘im tovushlari va surunkali og‘riq hissini bartaraf etish, cheklangan jag‘ harakatlarini tiklash hamda simptomlar qaytalanmagan holda uzoq muddatli funksional barqarorlikni ta’minlash imkonini berdi.

Xulosa: TMJ disfunksiyasini samarali davolash bo‘g‘im tuzilmalari, okkluzion aloqalar va ularni o‘rab turgan chaynash mushaklarini bir vaqtning o‘zida hisobga oladigan kompleks multidisiplinar yondashuvni talab qiladi. Murakkab okkluzion reabilitatsiyada TENS, maxsus ortotik qurilmalar va bo‘g‘im sonografiyasi kabi zamonaviy nerv-mushak usullaridan foydalanish uzoq muddatli prognoz va diagnostik aniqlikni sezilarli darajada yaxshilaydi.

Kalit so‘zlar: chaynash mushaklari gipertonusi, ortotik qurilma, okkluzion reabilitatsiya, TENS terapiyasi, nerv-mushak stomatologiyasi, TMJ disfunksiyasi.

Аннотация: В современной стоматологии диагностика и лечение дисфункции височно-нижнечелюстного сустава (ВНЧС) и связанных с ней синдромов хронической лицевой боли могут представлять значительную сложность. Традиционные изолированные ортопедические или ортодонтические методы лечения зачастую не обеспечивают длительного клинического улучшения, если не устранены лежащие в основе нервно-мышечные нарушения и мышечный гипертонус.

Цель исследования - оценить методы диагностики и лечения, применяемые в нервно-мышечной стоматологии, а также клиническую эффективность чрескожной электрической стимуляции нервов (TENS) и специально разработанной шинотерапии при лечении болезненных состояний, связанных с дисфункцией височно-нижнечелюстного сустава.

Материалы и методы: Эмпирическое исследование типичного клинического случая послужило основой для обзора современных научных исследований и клинических рекомендаций. Нервно-мышечный метод был применён для лечения 68-летней пациентки с хроническим болевым синдромом дисфункции ВНЧС, сопровождавшимся крепитацией сустава, ограниченной подвижностью нижней челюсти, передним открытым прикусом, шумом в ушах и выраженными рецидивирующими головными болями. В рамках схемы лечения для восстановления нормального положения нижней челюсти и вертикального размера окклюзии (VDO) применялись чрескожная электрическая стимуляция нервов (TENS) и специальный акриловый аппарат для нижнего зубного ряда (“Orthotic”).

Результаты исследования: Целенаправленная миорелаксация с применением TENS успешно уменьшила патологическую ноцицептивную активность, ослабила спазмы жевательных мышц и позволила точно зарегистрировать физиологическое нервно-мышечное положение нижней челюсти. Применение ортопедических шин в рамках длительной терапии позволило эффективно стабилизировать окклюзионные контакты, устранить суставные шумы и ощущения хронической боли, восстановить ограниченные движения челюсти и обеспечить долгосрочную функциональную стабильность без рецидива симптомов.

Заключение: Эффективное лечение дисфункции ВНЧС требует комплексного мультидисциплинарного подхода, одновременно учитывающего суставные структуры, окклюзионные взаимоотношения и окружающие жевательные мышцы. При сложной окклюзионной реабилитации применение современных нервно-мышечных методов, таких как TENS, специальные ортопедические аппараты и сонография сустава, значительно улучшает долгосрочный прогноз и диагностическую точность.

Ключевые слова: гипертонус жевательных мышц, ортопедический аппарат, окклюзионная реабилитация, TENS-терапия, нервно-мышечная стоматология, дисфункция ВНЧС.

INTRODUCTION

The most recent advancement in dentistry is a modern view of the architecture of the dentomaxillofacial system, which views teeth, muscles, and joints as an interconnected whole and seeks to establish a harmonic link between them. In Uzbek dentistry, the neuromuscular idea was not well understood until recently. A neuro-

muscular approach to patient care is being actively embraced and promoted by a number of dental training facilities, manufacturers, and professional associations.

Numerous conferences and symposia on neuromuscular dentistry and interdisciplinary treatment of patients with occlusal anomalies are held every year in Russia and beyond. This illustrates how functional neuromuscular dentistry is spreading quickly around the globe [1]. According to statistics, malocclusion affects more than 90% of people, and abnormalities of the temporomandibular joint (TMJ) and masticatory muscles are responsible for more than 65% of headaches. Airway constriction and spinal curvature may be caused by improper mandibular placement [2].

LITERATURE REVIEW

One of the most challenging multidisciplinary issues in contemporary clinical dentistry is the treatment of temporomandibular joint dysfunction (TMD) and related occlusal disharmonies. More than 65% of chronic tension headaches are directly associated with masticatory muscle hypertonicity and structural pathomechanics of the temporomandibular joint (TMJ), and more than 90% of the population has variable degrees of malocclusion [1, 2].

Static dental connections and hard-tissue alignment were the main focus of traditional orthodontic and prosthetic therapy. However, clinical experience shows that treating dental arches alone often fails to provide structural stability or long-term pain alleviation, especially in complicated or decompensated situations [3, 4].

Neuromuscular dentistry is a contemporary paradigm that views the teeth, periodontium, masticatory muscles, and TMJ as a single, dynamic system in order to overcome these constraints [1, 8]. Based on the physiological path of the mandible and the significance of neuromuscular balance, this method was created by Western researchers in the middle of the 20th century [8, 9]. By classifying TMJ diseases into distinct clinical groups and paying particular attention to neuromuscular and occlusal-articular dysfunction syndromes, Petrosov Yu. A. broadened the diagnostic scope in the domestic literature, providing a more precise foundation for focused therapy [5].

The objective is to evaluate the methods of diagnosis and therapy used in neuromuscular dentistry.

RESEARCH METHODOLOGY

This effort involved a comprehensive review of teaching materials, peer-reviewed scientific journals, and international literature, in addition to analysing clinical care methods based on a typical case report.

ANALYSIS AND RESULTS

Given the aetiology and classification of TMJ dysfunction, we provide the following clinical example. The patient, a 68-year-old lady, came to the Railway Dental Clinic in Samara a year ago with joint crepitus and TMJ clicking, left ear discomfort, tinnitus, trouble extending and shutting her jaw completely (open bite), and persistent migraines.

Painful syndrome of TMJ dysfunction was the diagnosis. Her medical history indicates that the illness began around three months prior to her presentation. Despite obtaining conservative medication on several occasions, which only provided short-term clinical relief, her pain condition did not improve.

Plan of Treatment:

In order to correctly align the mandible, the Orthotic, a detachable lower arch, was created.

Use of transcutaneous electrical nerve stimulation, or TENS, twice a week for three months.

1. **Initially, Orthotic Splint Therapy**

The clinic dealt with the pathology in great detail. The Orthotic appliance, a detachable temporary clear acrylic splint worn on the lower arch, was the primary treatment option used. By re-establishing the missing vertical dimension of occlusion (VDO) and creating a harmonious neuromuscular occlusion, it enables the surrounding muscles and joint structures to adjust to a normal posture [6]. The orthotic modifies the mandible's position and lessens the discomfort brought on by TMJ dysfunction.

To create the customised acrylic splint, the TENS device was first utilised to induce muscle relaxation. After that, a recording paste was placed on the teeth's occlusal surfaces while the jaw was in its normal neuromuscular posture. After the initial setting, the record was removed from the oral cavity and put on stone replicas to cure one more time before being created in a laboratory.

During the second visit, self-curing acrylic resin was placed on the occlusal surface of the splint to establish secure, reproducible occlusal contacts between the upper and lower arches. The patient wore the orthotic for three months, during which time it underwent progressive adjustments, such as selective grinding of the extra resin, while the mandible and muscles adjusted to the new position.

2. TENS, or Transcutaneous Electrical Nerve Stimulation

Another part of the patient's treatment plan was electrical nerve stimulation utilising a TENS device (Transcutaneous Electrical Nerve Stimulation) [7].

Low-frequency electrical impulses are sent to the muscles by a specific myomonitor to promote relaxation. Through surface skin electrodes, the battery-operated myomonitor stimulates motor neurones to specific masticatory muscle groups. The mandibular and facial muscles subsequently twitch in a coordinated manner every 1.5 seconds as a result of the impulses [8].

In order to temporarily interrupt abnormal nociceptive pathways and restore local neuromuscular function, the gadget stimulates peripheral nerve fibres. Increasing the amplitude of motor nerve stimulation results in rhythmic muscle contractions, decreases muscular spasms, and enhances local blood flow. By relaxing the head and neck muscles, the treatment enables the mandible to return to its normal neuromuscular trajectory.

Malocclusion causes the masticatory muscles to become hypertonic, which exacerbates structural dysfunction and causes the jaw to move abnormally. Patients are unable to actively reset this trajectory [9]. Therefore, to re-establish optimal occlusal conditions, cutting-edge technology is required. For six months, the patient received orthotic correction and TENS therapy twice a week.

Using neuromuscular principles, the patient was able to relieve chronic discomfort and obtain a stable, functioning occlusion.

In neuromuscular dentistry, further important diagnostic methods include:

One technique for capturing and analysing joint noises in the TMJ area is electrosonography. When the patient fully opens and closes their lips, sound is detected by high-sensitivity sensors attached to the skin covering the joint complexes. To assess TMJ integrity, acoustic data are evaluated using sophisticated software after recordings across four complete open-close cycles [10].

By recording tiny joint sounds, joint sonography, another non-invasive technique, allows medical professionals to evaluate articular disc position and general TMJ mechanics. Accurate occlusal reconstruction is ensured by the data collected, which enables the accurate identification of the spatial connection of the mandible to the maxilla [11-13].

Tinnitus, tooth attrition, joint crepitus or clicking during mandibular excursion, restricted mouth opening, and chronic headaches are common clinical indicators of occlusal disharmony. Many medical professionals try to address these issues with standard orthodontic or prosthodontic treatments alone, but if neuromuscular involvement is present, these methods are often futile. These symptoms often point to more severe structural dysfunctions that need thorough diagnostic and therapeutic methods, which are the main emphasis of neuromuscular dentistry.

Significant improvements in the treatment of challenging TMJ patients have resulted from the combination of state-of-the-art technology and improved understanding of the aetiology. Clinically, addressing facial pain issues with traditional orthodontic, prosthetic, or surgical methods is often unsuccessful [3].

American researchers established the scientific foundation of neuromuscular dentistry in the 20th century by demonstrating the physiological connection between muscle hypertonicity, occlusal instability, and TMJ disorders. With today's computerised diagnostic equipment, clinicians may precisely detect joint pathomechanics and ascertain the physiological trajectory of each patient's mandible.

The dentomaxillofacial system, which consists of the osseous structures (maxilla, mandible, and skull), their movable articulation (TMJ), ligaments, tendons, muscles, investing soft tissues, nerves, arteries, and dental arches, is disrupted by TMJ dysfunction. Depending on the severity and each person's capacity for adaptation, a pathological change in any one component of the masticatory apparatus might disturb the whole system, leading to clinical states that are either compensated or decompensated [4].

Unilateral mastication, acute hyperextension (large mouth opening), and iatrogenic factors such as non-physiological orthodontic or prosthodontic treatment are among the etiological variables that contribute to TMJ dysfunction. To organise the diagnosis, TMJ issues are categorised under Classes XI and XIII of the International Classification of Diseases (ICD-10):

Class XI:

1. Syndrome of temporomandibular joint pain and dysfunction;
2. Costen's syndrome;
3. Clicking of the jaw due to TMJ subluxation;
4. TMJ dysfunction-related pain.

Class XIII: Connective tissue and musculoskeletal disorders.

Yu. A. Petrosov's classification system takes a more comprehensive clinical approach, categorising TMJ dysfunctions as:

- neuromuscular dysfunction syndrome;
- occlusal-articular dysfunction syndrome;
- joint dislocation on a regular basis [5].

CONCLUSION AND SUGGESTIONS

Neuromuscular techniques are essential for challenging dental operations such as whole-mouth reconstructions, occlusal rehabilitation, and treating neck discomfort and other TMJ-related issues. Long-term stability and treatment outcomes are enhanced by the use of neuromuscular principles.

Two TMJ classifications, ICD-10 and Petrosov's scheme, provide a structured approach to diagnosing and treating these complex illnesses.

In addition to conventional orthodontic, prosthetic, and conservative treatments, a full multidisciplinary approach is needed to address TMJ dysfunction. It is necessary to treat the surrounding muscles and joint structures.

In neuromuscular dentistry, joint sonography, tailored acrylic orthotic appliances, and transcutaneous electrical nerve stimulation (TENS) are crucial diagnostic and treatment techniques.

References:

1. Ronkin K. Better to see once... DentalMarket. 2012;(3):77-79. (In Russ.)
2. Gross M.D., Mathews J.D. Occlusion in Clinical Practice. Moscow: Meditsina; 1986. 288 p. (In Russ.)
3. Antonik M.M. Virtual-real technique of diagnosis, planning, and prosthodontic treatment of patients with occlusal disorders complicated by temporomandibular joint dysfunction. Russian Journal of Dentistry. 2012;(1):17-20. (In Russ.
4. Petrosov Yu.A. Diagnosis and Orthopedic Treatment of Temporomandibular Joint Disorders. Krasnodar; 2007. 213 p. (In Russ.)
5. Yucel M.A. Evaluating the additional effects of arthrocentesis on the condylar pathways of temporomandibular joint in patients with internal derangement treated with stabilizing splint. Journal of Cranio-Maxillofacial Surgery. 2014;42(5):86-90.
6. Malik A.H. Efficacy of temporomandibular joint arthrocentesis on mouth opening and pain in the treatment of internal derangement of TMJ. Journal of Cranio-Maxillofacial Surgery. 2014;42(3):244-248.
7. Ronkin K. Application of neuromuscular dentistry principles in reconstructive prosthodontics of patients with malocclusion and TMJ dysfunction. Dental Kaleidoscope. 2007;(1):18-28. (In Russ.)
8. Chan C.A. Applying the Neuromuscular Principles in TMD and Orthodontics. 2004. 148 p.
9. Greenan R. Dental radiology and its influence on neuromuscular occlusion. 2007. 160 p.
10. Jacobs O.E. Experience in using sonography. Journal of Radiology and Nuclear Medicine. 2014;(1):23-32. (In Russ.)
11. Ishmurzin P.V., Danilova M.A., Ubiriya Yu.I. Compensation of dentoalveolar anomalies combined with temporomandibular joint dysfunction: evaluation of long-term treatment outcomes. The Dental Institute. 2012;2(55):40-41. (In Russ.)
12. Naumenko Yu.N., Ishmurzin P.V., Danilova M.A. The effect of orthodontic treatment on the state of the temporomandibular joint: a comprehensive analysis of changes. Orthodontics. 2011;1(53):52-56. (In Russ.)

13.00.00 Pedagogika fanlari
13.00.01 Pedagogika nazariyasi. Pedagogik ta’limotlar tarixi
13.00.02 Ta’lim va tarbiya nazariyasi va metodikasi (sohalar bo‘yicha)
13.00.03 Maxsus pedagogika
13.00.04 Jismoniy tarbiya va sport mashg‘ulotlari nazariyasi va metodikasi
13.00.05 Kasb-hunar ta’limi nazariyasi va metodikasi
13.00.06 Elektron ta’lim nazariyasi va metodikasi (ta’lim sohalari va bosqichlari bo‘yicha)
13.00.07 Ta’limda menejment
13.00.08 Maktabgacha ta’lim va tarbiya nazariyasi va metodikasi
13.00.09 Ijtimoiy pedagogika
07.00.00 Tarix fanlari
19.00.00 Psixologiya fanlari
01.00.00 Fizika-matematika fanlari
02.00.00 Kimyo fanlari
03.00.00 Biologiya fanlari
09.00.00 Falsafa fanlari
10.00.00 Filologiya fanlari
11.00.00 Geografiya fanlari

MAKTABGACHA VA MAKTAB TA'LIMI

Mas'ul muharrir: Ramzidin Ashurov
Ingliz tili muharriri: Murod Xoliyorov
Musahhih: Alibek Zokirov
Sahifalovchi va dizayner: Iskandar Islomov

2026. №8(2)

"Maktabgacha va maktab ta'limi" jurnali 26.09.2023-yildan
O'zbekiston Respublikasi Prezidenti Adminstratsiyasi huzuridagi
Axborot va ommaviy kommunikatsiyalar agentligi tomonidan
№C–5669363 reyestr raqami tartibi bo'yicha ro'yxatdan o'tkazilgan.
Litsenziya raqami: № 136361.

Manzilimiz: Toshkent shahar, Yunusobod tumani
19-mavze, 17-uy.