

CHARACTERISTICS OF THE QUALITY OF LIFE OF ELDERLY PATIENTS
WITH TRAUMATIC DAMAGE OF THE LOWER JAW AS A CRITERION
OF THE EFFICIENCY OF REHABILITATION INTERVENTION

ХАРАКТЕРИСТИКА ЯКОСТІ ЖИТТЯ ХВОРИХ ПОХИЛОГО ВІКУ
З ТРАВМАТИЧНИМ УШКОДЖЕННЯМ НИЖНЬОЇ ЩЕЛЕПИ
ЯК КРИТЕРІЙ ЕФЕКТИВНОСТІ РЕАБІЛІТАЦІЙНОГО ВТРУЧАННЯ

Nesterchuk N. Ye., Gamma T. V., Korobkova R. M.
National University of Water and Environmental Engineering,
Institute of Health Care, Rivne, Ukraine
ORCID: 0000-0003-2199-3403
ORCID: 0000-0001-9295-3375
ORCID: 0009-0004-6275-3056

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Abstracts

Purpose is to investigate the dynamics of quality of life from the standpoint of specific dental condition and general somatic health as criteria for the effectiveness of rehabilitation intervention aimed at correcting the consequences of mandibular fractures in patients of older age groups.

Methods. 42 elderly and senile people took part in the research process. Group 1 consisted of 23 individuals whose history was not burdened by a fracture of the bones of the facial skull. Group 2 included 19 people with the consequences of a fracture of the lower jaw. A program of physical therapy was developed for them, aimed at co-correction of detected violations and improvement of quality of life lasting 1 month. Active techniques included therapeutic exercises for masticatory and facial muscles, tongue, neck, and their post-isometric relaxation. Passive techniques included massage of the masticatory muscles, passive mobilization of the temporomandibular joint. Patients' quality of life was assessed by the Geriatric Oral Health Assessment Index, The Short Form-36.

The results. The rehabilitation program, developed from the standpoint of the age-related features of bone tissue healing and the needs of functional load, had a beneficial effect on the quality of life of the elderly and senile with the consequences of a fracture of the lower jaw, which, upon repeated examination, was manifested in the form of an improvement in the studied indicators. All GOHAI indicators of group 2 improved statistically significantly relative to the initial level ($p < 0.05$), but only the indicator related to contacts with other people reached the parameters of the main group 1 ($p > 0.05$). Analyzing the obtained result, it was noted that the SF-36 scale reached the level of uninjured peers ($p > 0.05$); on all scales, except "Vitality" and "Mental health", there was an improvement relative to the initial indicator ($p < 0.05$).

Conclusions. The developed comprehensive rehabilitation program demonstrated a statistically significant positive effect ($p < 0.05$) on all studied indicators of quality of life compared to baseline data (although the level of quality of life associated with dental dysfunction was not reached), which confirms the need for the use of specialized restoration in patients of older age groups with injuries of the lower jaw for a long time.

Key words: bone fracture, lower jaw, gerontology and geriatrics, rehabilitation in stomatology, physical therapy.

Мета – дослідити динаміку якості життя з позиції специфічного стоматологічного стану та загального соматичного здоров'я як критеріїв ефективності реабілітаційного втручання, спрямованого на корекцію наслідків переломів нижньої щелепи у пацієнтів старших вікових груп.

Методи. У процесі дослідження взяли участь 42 особи похилого та старечого віку. Групу 1 становили 23 особи, у яких анамнез не був обтяжений переломом кісток лицьового черепа. До групи 2 групи увійшли 19 осіб з наслідками перелому нижньої щелепи. Для них була розроблена програма фізичної терапії, спрямована на корекцію виявлених порушень та покращення якості життя тривалістю 1 місяць. Активні техніки включали терапевтичні вправи для жувальної та мимічної мускулатури, язика, шиї, їх постізометричну релаксацію. Пасивні техніки включали масаж жувальних м'язів, пасивну мобілізацію скронево-нижньощелепного суглоба. Якість життя пацієнтів оцінювали за Geriatric Oral Health Assessment Index, The Short Form-36.

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Результати. Розроблена з позицій вікових особливостей загоєння кісткової тканини та потреб функціонального навантаження програма реабілітації сприятливо вплинула на якість життя осіб похилого та старечого віку з наслідками перелому нижньої щелепи, що під час повторного обстеження проявилось у вигляді покращення досліджуваних показників. Усі показники GONAI групи 2 статистично значуще покращились стосовно вихідного рівня ($p < 0,05$), але тільки за показником, пов'язаним з контактами з іншими людьми, досягли параметрів основної групи 1 ($p > 0,05$). Аналізуючи отриманий результат, відзначено досягнення за шкалами SF-36 рівня нетравмованих однолітків ($p > 0,05$); за всіма шкалами, крім «Vitality» та «Mental health», відбулось покращення стосовно вихідного показника ($p < 0,05$).

Висновки. Розроблена комплексна програма реабілітації продемонструвала статистично значущий позитивний вплив ($p < 0,05$) на всі досліджувані показники якості життя порівняно з вихідними даними (хоча рівня якості життя, пов'язаного зі стоматологічною дисфункцією, не було досягнуто), що підтверджує необхідність застосування спеціалізованого відновлення у пацієнтів старших вікових груп з травмами нижньої щелепи тривалий час.

Ключові слова: перелом кістки, нижня щелепа, геронтологія та гериатрія, реабілітація у стоматології, фізична терапія.

Introduction. Recently, the interest of scientists in the problems of dental health in order to ensure the quality of people's life has been steadily increasing. The quality of life is understood as the ability of an individual to function in society in accordance with his position and to enjoy life [3; 11; 18]. Quality of life is an integral indicator that reflects a person's assessment of the degree of his well-being, ability to function in society – his work and social activities, personal life, brightness of worldview, ability to self-realization, etc. In addition, it abstractly summarizes the entire complex of physical, emotional, mental and intellectual characteristics of the patient. The dependence of the level of quality of life on the state of the maxillofacial system is largely determined by the functions assigned to it. Dental health determines the quality of nutrition, plays an aesthetic role and to some extent determines the well-being of an individual. There is another important role of teeth: they are an important attribute of full-fledged speech, active verbal communication, sociability at any age, and therefore, the fullness of the psyche and behavioral reactions [12]. Dental quality of life is also defined as a subjective assessment of oral health and the impact of its pathology on function, as well as a person's mental and social status [3; 11; 15].

In recent years, in parallel with the growth of general injuries, the number of injuries to the maxillofacial area has been steadily increasing. Fractures of the lower jaw make up from 70 to

85% of all facial bone fractures [4; 8]. Despite the successes achieved in their treatment, various complications of the post-immobilization period and the consequences of surgical correction of an inflammatory, dystrophic nature reach 35–40%, and impairment of functional capacity in the form of limitation of the amplitude of movements in the temporomandibular joint is a characteristic feature of such injuries [9].

The specific weight of elderly people in the general structure of victims with facial bone fractures ranges from 7.0 to 11.3% [8]. In this regard, issues of diagnosis, choice of treatment method and subsequent rehabilitation of fractures of the bones of the facial skeleton in elderly and senile patients are of particular importance and interest.

Belonging to older age groups determines the main features and complexity of orthopedic treatment of this group of patients in connection with a significant decrease in the number of teeth, a decrease in the adaptation capabilities of the body, and comorbid pathology. Orthopedic treatment of elderly and senile people with fractures of the lower jaw requires taking into account the mental and somatic status of these patients (which can negatively affect the formation of bone calluses), the state of the organs and tissues of the oral cavity and the maxillofacial system due to the appearance of age-related changes and disorders in them [10; 13; 14]. The quality of life in gerontostomatology is considered a separate problem caused by the burden of comorbid and polymorbid conditions

of the maxillofacial area and the body as a whole [3; 11; 18].

Diseases of the dental profile, which are accompanied by the loss of teeth, weakening of the strength of the chewing muscles, and pain in the elderly are a predictor of the occurrence and progression of a dangerous geriatric syndrome – malnutrition [3; 4].

Unified examination of health disorders of dental patients from the standpoint of evidence-based rehabilitation, in particular, physical therapy, is a relatively under-researched area of modern rehabilitation practice in Ukraine. The effectiveness of the use of therapeutic exercises, manual techniques for the correction of changes that occur in the orofacial area as a result of inflammatory and traumatic injuries was demonstrated [7; 17]. It has been proven that physical therapy has a beneficial effect on the functioning of various types of pathology of the musculoskeletal system in the elderly [5; 16].

Based on the above, the issues of improving the treatment and further rehabilitation of the consequences of fractures of the bones of the facial skeleton in elderly and senile patients remain significant and relevant, which formed the basis of our research.

The purpose of the study is to investigate the dynamics of the quality of life from the standpoint of a specific dental condition and general somatic health as criteria for the effectiveness of a rehabilitation intervention aimed at correcting the consequences of mandibular fractures in patients of older age groups.

Materials and methods. 42 elderly and senile people took part in the research process.

Group 1 consisted of 23 individuals whose history was not burdened by a fracture of the bones of the facial skull. Among them, 14 elderly people (8 men, 6 women, 67.7 ± 2.5 years old) and 9 elderly people (4 men, 5 women, 77.5 ± 1.4 years old) were examined.

Group 2 included 19 people with consequences of a fracture of the lower jaw: 13 elderly people (8 men, 5 women, 65.2 ± 0.8 years) and 6 elderly people (3 men, 3 women, 77.3 ± 0.8 years old). Fracture treatment tactics corresponded to the principles of the Evidence-Based Clinical

Guideline ‘Injuries of the Maxillofacial Area’ [1] and the Standard of Medical Care “Noninflammatory Fractures of the Mandible (condylar process, ramus, angle, body, and symphysis)” [2]. The patients were examined 1–1.5 months after the injury, after radiologically confirmed formation of the primary bone callus (after consulting a dentist).

A 1-month physical therapy program aimed at correcting the signs of deterioration of masticatory function was developed for people in group 2. It included active and passive techniques to mobilize the lower jaw and improve masticatory function. Active techniques included therapeutic exercises for the chewing and facial muscles, tongue, and neck, as well as their post-isometric relaxation. Passive techniques included massage of the masticatory muscles, passive mobilization of the temporomandibular joint (alone or with the help of adapted means that statically held the mouth in an open position). Rehabilitation interventions were carried out three times a week, lasting 1 hour. During the rehabilitation intervention, it was taken into account that due to osteoporosis and atrophy of bone tissue, there is a high risk of repeated trauma, especially in the case of multifragmentary fractures, so the load on the jaw in the process of correcting the contracture of the temporomandibular joint was carried out carefully, focusing on the subjective feelings of the patient. An obligatory part of working with patients was their counseling, aimed at forming a diet that is gentle on physical qualities (primarily – on the hardness of food), avoiding excessive load when biting – cutting products into small pieces, eating food with a puree-like consistency, etc. During the practical implementation of the program, methodological features were observed that helped the elderly learn the program: demonstration of movements and simultaneous performance of tasks with patients, clear voice commands and prompts, explanations of exercises were used.

The condition at the time of the examination was the absence of an acute disease or exacerbation of a chronic disease in the examined persons.

The quality of life associated with dental dysfunction in a geriatric patient was assessed by the Geriatric Oral Health Assessment Index (GOHAI) with possible answer options: 1 – never, 2 – sometimes, 3 – frequently, 4 – always [6; 12].

The general health-related quality of life was determined by the non-specific questionnaire SF-36 (The Short Form-36), which is characterized by scales of physical function, role physical, bodily pain, general health, vitality, social function, role emotional and mental health. Scores range between 0 (poor) and 100 (best) [19].

The study was conducted taking into account the principles of the Helsinki Declaration of the World Medical Association “Ethical principles of medical research involving a person as an object of research”. Informed consent to participate in the study was obtained from all persons involved in the study.

Statistical processing of the results was carried out in the “Statistica 10” program. Arithmetic mean value, standard deviation, standard error of the mean calculated to describe the obtained quantitative characteristics. Differences at $p < 0.05$ were considered statistically significant.

Research results. The initial examination revealed a significant deterioration in the quality of life of patients of older age groups with the consequences of a fracture of the lower jaw

compared to their peers, both specific dental (according to GOHAI) and general somatic (according to SF-36).

Subjective assessment of the quality of life, made by the patient himself, reflects his psychological status, the effectiveness of the treatment being carried out, allows to determine the impact of the disease itself, as well as the treatment on the patient's condition. Assessment of dental quality of life is determined by subjective indicators illustrating the impact of oral health on a person's quality of life along with assessment of the need for dental services [18].

When analyzing the results of GOHAI, it should be noted that in patients of older age groups, regardless of the presence of trauma, violations of the quality of life associated with the dental status were determined, which was obviously associated with atrophic changes of the mucous membranes, the presence of compensated or subcompensated conditions from the side tooth rows, age-related muscle weakness of facial and swallowing muscles. First of all, it concerned questions related to the use of solid food (table 1).

Individuals with consequences of mandibular trauma were found to be worse relative to their peers on the GOHAI questions related to biting, chewing, swallowing food, facial aesthetics, and communication problems (Table 1). This can be associated with discomfort in the

Table 1

Dynamics of dental quality of life indicators according to GOHAI in elderly patients with mandibular trauma under the influence of rehabilitation measures ($\bar{x} \pm S$)

Question scale, points	Group 1	Group 2	
		First examination	Repeat examination
Limitation of foods	2.35±0.12	3.48±0.11*	2.77±0.13*∴
Trouble biting firm meat and apples	2.82±0.09	3.75±0.05*	3.14±0.08*∴
Discomfort during swallowing	1.66±0.12	2.08±0.13*	1.75±0.08∴
Prevents from speaking comfortably	1.52±0.09	2.25±0.12*	1.85±0.07*∴
Discomfort during eating	2.07±0.16	3.56±0.25*	2.90±0.16*∴
Contact with people limited by this condition	1.64±0.08	2.15±0.17*	1.73±0.05∴
Unhappy with looks	1.78±0.15	2.81±0.19*	2.10±0.14*∴
Medication to relieve pain or discomfort	1.15±0.03	2.19±0.07*	1.71±0.15*∴
Worries about problems with teeth or denture	2.12±0.23	3.61±0.10*	2.61±0.15*∴
Felt nervous or self-conscious	1.55±0.13	2.57±0.22*	1.92±0.19*∴
Felt uncomfortable eating in front of other people	1.63±0.20	3.05±0.16*	2.44±0.15*∴
Sensitive to hot, cold or sweet foods	1.82±0.16	3.12±0.11*	2.45±0.16*∴

Notes: * – $p < 0.05$ – statistically significant difference between group 1 and group 2 parameters;

∴ – $p < 0.05$ – statistically significant difference between the parameters of group 2 at the first and second examinations.

fracture area that occurs during mechanical stress, post-immobilization contracture of the temporomandibular joint, swallowing disorders due to impaired chewing and muscle weakness, psychological discomfort.

Changes in the dental status negatively affected the general somatic condition of patients in group 2, even taking into account the fact that the elderly and senile subjects of both groups had other polymorbid conditions that caused a decrease in the quality of life. We consider the causes of this condition to be slow recovery after injuries in older age groups, which leads to long-term mental and physical discomfort with the corresponding reflection of this in the scales of the SF-36 quality of life questionnaire (table 2).

The rehabilitation program, developed from the standpoint of the age-related features of bone tissue healing and the needs of functional load, had a beneficial effect on the quality of life of the elderly and senile with the consequences of a fracture of the lower jaw, which, upon repeated examination, was manifested in the form of an improvement in the studied indicators.

Improvement of the quality of life according to GOHAI dynamics in group 2 according to the indicator “Limitation of foods” was from 3.48±0.11 points to 2.77±0.13 points, “Trouble biting firm meat and apples” – from 3.75±0.05 points to 3.14±0.08 points, “Discomfort during swallowing” – from 2.08±0.13 points to 1.75±0.08 points, “Prevents from speaking comfortably” – from 2.25 ±0.12 points to 1.85±0.07 points, “Discomfort during

eating” – from 3.56±0.25 points to 2.90±0.16 points, “Contact with people limited by this condition” – from 2.15±0.17 points to 1.73±0.05 points, “Unhappy with looks” – from 2.81±0.19 points to 2.10±0.14 points, “Medication to relieve pain or discomfort” – from 2.19±0.07 points to 1.71±0.15 points, “Worries about problems with teeth or denture” – from 3.61±0.10 points to 2.61±0.15 points, “Felt nervous or self-conscious” – from 2.57±0.22 points to 1.92±0.19 points, “Felt uncomfortable eating in front of other people” – from 3.05±0.16 points to 2.44±0.15 points, “Sensitive to hot, cold or sweet foods” – from 3.12±0.11 points to 2.45±0.16 points. All indicators of group 2 improved statistically significantly relative to the initial level (p<0.05), but only the indicator related to contacts with other people reached the parameters of the main group 1 (p>0.05).

After the implementation of the rehabilitation program, an improvement in the quality of life was achieved according to the SF-36 scales in persons of the main group 2 – “Physical function” – from 55.44±8.16 points to 63.20±6.12 points, “Role physical” – from 65.11±5.63 points to 70.09±5.16 points, “Bodily pain” – from 50.09±5.12 points to 59.13±6.12 points, “General health” – from 48.11 ±5.45 points to 55.26±4.13 points, “Vitality” – from 60.12±4.22 points to 68.09±7.18, “Social function” – from 65.11±5.12 points to 78.22±6.09 points, “Role emotional” – from 59.48±7.54 points to 68.52±4.06 points, “Mental health” – from 65.13±6.08 points to 70.15±10.15 points.

Table 2

Dynamics of indicators of somatic quality of life according to SF-36 in elderly patients with trauma of the lower jaw under the influence of rehabilitation measures ($\bar{x} \pm S$)

Scale, points	Group 1	Group 2	
		First examination	Repeat examination
Physical function	70.56±5.12	55.44±8.16*	63.20±6.12∴
Role physical	74.39±3.44	65.11±5.63*	70.09±5.16∴
Bodily pain	68.22±6.28	50.09±5.12*	59.13±6.12∴
General health	60.12±7.12	48.11±5.45*	55.26±4.13∴
Vitality	76.14±6.18	60.12±4.22*	68.09±7.18
Social function	80.07±5.15	65.11±5.12*	78.22±6.09∴
Role emotional	75.20±8.40	59.48±7.54*	68.52±4.06∴
Mental health	71.69±7.16	65.13±6.08	70.15±10.15

Notes: * – p<0.05 – statistically significant difference between group 1 and group 2 parameters;

∴ – p<0.05 – statistically significant difference between the parameters of group 2 at the first and second examinations.

Analyzing the obtained result, it was noted that the SF-36 scale reached the level of uninjured peers ($p > 0.05$); on all scales, except “Vitality” and “Mental health”, there was an improvement relative to the initial indicator ($p < 0.05$).

Discussion. The quality of life in dentistry is understood as an assessment of both the physical, but also the social and psychological components of dental health. Ways of studying the impact of dental health on the quality of life can be conventionally divided into three groups: functional (establishing the subjective attitude of the individual when evaluating some functions of the body); hermeneutic (determining the subjective perception of problems existing in the individual); utility analysis (adjusted life expectancy, numerical evaluation) [12; 13; 18].

Bone injuries in the elderly represent a serious threat, which is associated with a decrease in the ability to regenerate, caused by the depletion of the pool of mesenchymal stem cells, a violation of vascularization due to systemic atherosclerosis, osteoporosis due to changes in mineral metabolism [8; 14]. Damage to the maxillofacial region is not an exception, often leading to disability, in particular in the social aspect. Comorbid diseases, which are often found in this age group, and long-term use of certain drugs that affect the functioning of various body systems [5; 16] have a significant impact during a traumatic illness.

To date, the world literature has not developed a unified approach to the rehabilitation of patients of the older age group with fractures of the lower jaw. This is primarily due to the lack of clinical studies, which allow to substantiate

the advantages of one or another technique at the evidential level. This category of patients is a clinically difficult group that differs in a number of features [11; 12; 13; 15]. A significant proportion of elderly and senile persons in the general structure of patients with fractures of the lower jaw determines the urgency of further conducting relevant clinical studies.

The material presented in the work can be used to develop an algorithm for the complex rehabilitation of patients of the older age group with fractures of the lower jaw, which take into account both their general geriatric and local dental status and the quality of life associated with them. This task can be solved not by isolating individual clinical aspects, but only on the basis of a broad approach to the correction of the problem of the consequences of trauma in older age groups in general, using the existing experience of rehabilitation of dental patients [7; 17].

Conclusions. In elderly and senile patients with the consequences of mandibular fracture, the quality of life is determined both from the standpoint of dental dysfunction (according to the Geriatric Oral Health Assessment Index Questionnaire) and non-specific health-related quality of life (according to the SF-36). The developed comprehensive rehabilitation program demonstrated a statistically significant positive effect ($p < 0.05$) on all studied indicators of quality of life compared to baseline data (although the level of quality of life associated with dental dysfunction was not reached), which confirms the need for the use of specialized restoration in patients of older age groups with injuries of the lower jaw for a long time.

Література

1. Стандарт медичної допомоги. Невогнепальні переломи нижньої щелепи (виросткового відростка, гілки, кута, тіла та симфізу). URL: https://www.dec.gov.ua/wp-content/uploads/2023/06/1096_16062023_smd.pdf.
2. Травми щелепно-лицевої ділянки. Клінічна настанова, заснована на доказах. URL: https://www.dec.gov.ua/wp-content/uploads/2023/02/2023_kn_travma.pdf.
3. Adetayo A.M., Somoye M.S., Fasesan O.A., Oyedele A.T., Adetayo M.O. Factors Associated

with Deterioration in Quality of Life of Subjects after Maxillofacial Fractures – A Prospective Study. *Ann Maxillofac Surg.* 2023. № 13(2). P. 189–194. doi: 10.4103/ams.ams_38_23.

4. Adik K., Lamb P., Moran M., Childs D., Francis A., Vinyard C.J. Trends in mandibular fractures in the USA: A 20-year retrospective analysis. *Dent Traumatol.* 2023. № 39(5). P. 425–436. doi: 10.1111/edt.12857.

5. Aravitska M., Saienko O. The influence of physical therapy on indicators of locomotive syndrome in elderly persons with osteoarthritis

of the knee and obesity. *Clinical and Preventive Medicine*. 2023. 4. 6–13. [https://doi.org/10.31612/2616-4868.4\(26\).2023.01](https://doi.org/10.31612/2616-4868.4(26).2023.01).

6. Atchison K.A., Dolan T.A. Development of the Geriatric Oral Health Assessment Index. *J Dent Educ*. 1990. № 54(11). P. 680–687.

7. Azam I., Chahal A., Kapoor G., et al. Effects of a program consisting of strain/counterstrain technique, phonophoresis, heat therapy, and stretching in patients with temporomandibular joint dysfunction: A pilot study. *Medicine (Baltimore)*. 2023. № 102(32). P.e34569. doi: 10.1097/MD.00000000000034569.

8. Bera R.N., Tiwari P. Current Evidence for the Management of Edentulous Atrophic Mandible Fractures: A PRISMA-SWiM Guided Review. *Cranio-maxillofac Trauma Reconstr*. 2023. № 16(4). P. 317–332. doi: 10.1177/19433875221115585.

9. Boffano P., Rocca F., Zavattoni E., et al. European Maxillofacial Trauma (EURMAT) project: a multicentre and prospective study. *J Cranio-maxillofac Surg*. 2015. № 43(1). P. 62–70. doi: 10.1016/j.jcms.2014.10.011.

10. Grygus I., Kostyshyn A., Ilnytska O., Ornat H. The condition of the masticatory muscle group in the treatment of patients with reduced occlusion height. *Health Prob Civil*. 2022. № 16(2). P. 164–172. <https://doi.org/10.5114/hpc.2022.115000>.

11. El Osta N., Haddad E., Fakhouri J., Saad R., El Osta L. Comparison of psychometric properties of GOHAI, OHIP-14, and OHIP-EDENT as measures of oral health in complete edentulous patients aged 60 years and more. *Qual Life Res*. 2021. № 30(4). P. 1199–1213. doi: 10.1007/s11136-020-02709-w.

12. El Osta N., Tubert-Jeannin S., Hennequin M., Bou Abboud Naaman N., El Osta L., Geahchan N. Comparison of the OHIP-14 and GOHAI as measures of oral health among elderly in Lebanon. *Health Qual Life Outcomes*. 2012. № 10. P. 131. doi: 10.1186/1477-7525-10-131.

13. Kannari L., Marttila E., Oksa M., Furuholm J., Snäll J. Non-Surgical Site-Related Complications in Mandibular Fracture Surgery – A Problem of Elderly Patients? *J Oral Maxillofac Surg*. 2024. № 82(1). P. 47–55. doi: 10.1016/j.joms.2023.10.004.

14. Kim T.G., Chung K.J., Lee J.H., Kim Y.H., Lee J.H. Clinical Outcomes Between Atrophic and Nonatrophic Mandibular Fracture in Elderly Patients. *J Craniofac Surg*. 2018. № 29(8). P. e815–e818. doi: 10.1097/SCS.0000000000004863.

15. Kinash I., Kaminska M., Stasiuk M., Grygus I., Zukow W. Bacteriological study of

oral microbiocenosis as a starting point for begin pharmaceutical treatment. *Pharmacologyonline*. 2021. Vol. 2. 7–16.

16. Koval N., Aravitska M. Dynamics of kinesiphobia and physical functioning parameters in the elderly adults with sarcopenic obesity under the influence of the physical therapy program. *Clinical and Preventive Medicine*. 2023. № 4. P. 88–95. DOI: [https://doi.org/10.31612/2616-4868.4\(26\).2023.13](https://doi.org/10.31612/2616-4868.4(26).2023.13).

17. Petronis Z., Spaicyte N., Sakalys D., Januzis G. Functional Rehabilitation after Mandibular Fracture – A Systematic Review. *Ann Maxillofac Surg*. 2022. № 12(2). P. 197–202. doi: 10.4103/ams.ams_99_22.

18. Ustaoglu G., Goller Bulut D., Gumus K.C., Ankarali H. Evaluation of the effects of different forms of periodontal diseases on quality of life with OHIP-14 and SF-36 questionnaires: A cross-sectional study. *Int J Dent Hyg*. 2019. № 17(4). P. 343–349. doi: 10.1111/idh.12409.

19. Ware J.E., Jr., Kosinski M., Keller S.D. SF-36 Physical and Mental Summary Scales: A User's Manual. Boston, MA: The Health Institute, New England Medical Center. 1994.

References

1. Travmy shchelepno-lytsevoyi dilyanky. Klinichna nastanova, zasnovana na dokazakh [Injuries of the maxillofacial region. Evidence-based clinical practice]. Retrieved from: https://www.dec.gov.ua/wp-content/uploads/2023/02/2023_kn_travma.pdf [in Ukrainian].

2. Standart medychnoyi dopomogy. Nevognepalni perelomy nyzhnoyi shchelepy (vyrostkovogo vidrostka, gilky, kuta, tila ta symfizu) [Standard of medical care. Non-inflammatory fractures of the lower jaw (condylar process, branch, angle, body and symphysis)]. Retrieved from: https://www.dec.gov.ua/wp-content/uploads/2023/06/1096_16062023_smd.pdf [in Ukrainian].

3. Adetayo, A.M., Somoye, M.S., Fasesan, O.A., Oyedele, A.T., & Adetayo, M.O. (2023). Factors Associated with Deterioration in Quality of Life of Subjects after Maxillofacial Fractures – A Prospective Study. *Annals of maxillofacial surgery*, 13(2), 189–194. https://doi.org/10.4103/ams.ams_38_23.

4. Adik, K., Lamb, P., Moran, M., Childs, D., Francis, A., & Vinyard, C.J. (2023). Trends in mandibular fractures in the USA: A 20-year retrospective analysis. *Dental traumatology: official publication of International Association for Dental Traumatology*, 39(5), 425–436. <https://doi.org/10.1111/edt.12857>.

5. Aravitska M., & Saienko O. (2023). The influence of physical therapy on indicators of locomotive syndrome in elderly persons with osteoarthritis of the knee and obesity. *Clinical and Preventive Medicine*, 4, 6–13. [https://doi.org/10.31612/2616-4868.4\(26\).2023.01](https://doi.org/10.31612/2616-4868.4(26).2023.01).
6. Atchison, K.A., & Dolan, T.A. (1990). Development of the Geriatric Oral Health Assessment Index. *Journal of dental education*, 54(11), 680–687.
7. Azam, I., Chahal, A., Kapoor, G., Chaudhuri, P., Alghadir, A.H., Khan, M., Kashoo, F.Z., Esht, V., Alshehri, M.M., Shaphe, M.A., Khan, A.R., & Singh, G. (2023). Effects of a program consisting of strain/counterstrain technique, phonophoresis, heat therapy, and stretching in patients with temporomandibular joint dysfunction: A pilot study. *Medicine*, 102(32), e34569. <https://doi.org/10.1097/MD.00000000000034569>.
8. Bera, R.N., & Tiwari, P. (2023). Current Evidence for the Management of Edentulous Atrophic Mandible Fractures: A PRISMA-SWIM Guided Review. *Cranio-maxillofacial trauma & reconstruction*, 16(4), 317–332. <https://doi.org/10.1177/19433875221115585>.
9. Boffano, P., Rocchia, F., Zavattero, E., Dediol, E., Uglešić, V., Kovačić, Ž., Vesnaver, A., Konstantinović, V.S., Petrović, M., Stephens, J., Kanzaria, A., Bhatti, N., Holmes, S., Pechalova, P.F., Bakardjiev, A.G., Malanchuk, V.A., Kopchak, A.V., Galteland, P., Mjøen, E., Skjelbred, P., ... Forouzanfar, T. (2015). European Maxillofacial Trauma (EURMAT) project: a multicentre and prospective study. *Journal of cranio-maxillo-facial surgery: official publication of the European Association for Cranio-Maxillo-Facial Surgery*, 43(1), 62–70. <https://doi.org/10.1016/j.jcms.2014.10.011>.
10. Grygus, I., Kostyshyn, A., Ilnytska, O., & Ornat, H. (2022). The condition of the masticatory muscle group in the treatment of patients with reduced occlusion height. *Health Prob Civil*, 16(2), 164–172. <https://doi.org/10.5114/hpc.2022.115000>.
11. El Osta, N., Haddad, E., Fakhouri, J., Saad, R., & El Osta, L. (2021). Comparison of psychometric properties of GOHAI, OHIP-14, and OHIP-EDENT as measures of oral health in complete edentulous patients aged 60 years and more. *Quality of life research: an international journal of quality of life aspects of treatment, care and rehabilitation*, 30(4), 1199–1213. <https://doi.org/10.1007/s11136-020-02709-w>.
12. El Osta, N., Tubert-Jeannin, S., Hennequin, M., Bou Abboud Naaman, N., El Osta, L., & Geahchan, N. (2012). Comparison of the OHIP-14 and GOHAI as measures of oral health among elderly in Lebanon. *Health and quality of life outcomes*, 10, 131. <https://doi.org/10.1186/1477-7525-10-131>.
13. Kannari, L., Marttila, E., Oksa, M., Furuholm, J., & Snäll, J. (2024). Non-Surgical Site-Related Complications in Mandibular Fracture Surgery – A Problem of Elderly Patients? *Journal of oral and maxillofacial surgery: official journal of the American Association of Oral and Maxillofacial Surgeons*, 82(1), 47–55. <https://doi.org/10.1016/j.joms.2023.10.004>.
14. Kim, T.G., Chung, K.J., Lee, J.H., Kim, Y.H., & Lee, J.H. (2018). Clinical Outcomes Between Atrophic and Nonatrophic Mandibular Fracture in Elderly Patients. *The Journal of craniofacial surgery*, 29(8), e815–e818. <https://doi.org/10.1097/SCS.00000000000004863>.
15. Kinash I., Kaminska M., Stasiuk M., Grygus I., Zukow W. (2021). Bacteriological study of oral microbiocenosis as a starting point for begin pharmaceutical treatment. *Pharmacologyonline*. Vol. 2. 7–16.
16. Koval N., & Aravitska M. (2023). Dynamics of kinesiphobia and physical functioning parameters in the elderly adults with sarcopenic obesity under the influence of the physical therapy program. *Clinical and Preventive Medicine*, 4, 88–95. DOI: [https://doi.org/10.31612/2616-4868.4\(26\).2023.13](https://doi.org/10.31612/2616-4868.4(26).2023.13).
17. Petronis, Z., Spaicyte, N., Sakalys, D., & Januzis, G. (2022). Functional Rehabilitation after Mandibular Fracture – A Systematic Review. *Annals of maxillofacial surgery*, 12(2), 197–202. https://doi.org/10.4103/ams.ams_99_22.
18. Ustaoglu, G., Göller Bulut, D., Gümüş, K.Ç., & Ankarali, H. (2019). Evaluation of the effects of different forms of periodontal diseases on quality of life with OHIP-14 and SF-36 questionnaires: A cross-sectional study. *International journal of dental hygiene*, 17(4), 343–349. <https://doi.org/10.1111/idh.12409>.
19. Ware J.E., Jr., Kosinski M., Keller S.D. (1994). *SF-36 Physical and Mental Summary Scales: A User's Manual*. Boston, MA: The Health Institute, New England Medical Center.

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