# Occurrence of Temporal Mandibular Joint Pathology Symptoms in Middle, Elderly and Senile Aged Persons

Roza Safiullovna Ibragimova, Ulmeken Rakhimovna Mirzakulova, Alma Temirkhanovna Kosmaganbetova, Mariyam Cozbaevna Iskakova, Zhartybaev Rakhmet

Kazakh National Medical University after S.D. Asfendiyarov
Address: 88, Tole bi street, Almaty, Kazakhstan, 050012

**Abstract:** The results of epidemiological and clinical studies of middle, elderly and senile aged persons, residing in Almaty city and Almaty oblast have been presented. Occurrence of different clinical symptoms of temporal mandibular joint functional disorders and inflammatory dystrophic diseases has been revealed and analyzed in them. The research work was performed within the framework of scientific and technical program called "Development of a model (program) of anti-aging active longevity of elderly and senile aged people in Kazakhstan", carried out by the RSE on the BRM « S.D. Asfendiyarov Kazakh National Medical University».
[Roza Safiullovna Ibragimova, Ulmeken Rakhimovna Mirzakulova, Alma Temirkhanovna Kosmaganbetova, Mariyam Cozbaevna Iskakova, Zhartybaev Rakhmet. **Occurrence of Temporal Mandibular Joint Pathology Symptoms in Middle, Elderly and Senile Aged Persons.** *Life Sci J* 2014;11(1s):184-190] (ISSN:1097-8135). http://www.lifesciencesite.com. 32

**Keywords:** temporal mandibular joint, functional disorders, arthritis, arthrosis, occlusal rehabilitation, prosthetics, middle age, elderly age, senile age.

## Introduction

For last decades the interest of physicians of various specialties significantly increased to the state of elderly aged and senile aged persons' health due to the changes in the structure of population in the developed countries with increasing proportion of such category of people [1].

Diseases of temporal mandibular joint (TMJ) occur in 20-76% of population, 70-89% of them compose various intra-articular functional disorders [2,3].

Critical review of publications about their epidemiology revealed a large difference of their prevalence indices among population. In particular, some authors state that 14-40% of population has various signs of TMJ dysfunction [4] and other researchers consider that 19-63% of population has these signs and adolescents constitute the majority among them (35-40%) [5].

Some authors don't mark the significant differences in distribution of this pathology according to gender [6]. However, most of the researchers state that the disease occurs mainly in females and accounts 70-80% of a number of all observations [7, 8, 9].

The onset and development of this disease depends on the conditions and the mode of life, age of patients, the state of their mastication apparatus and a number of other factors. The prevalence of TMJ diseases in elderly and senile aged patients is little studied and the available data on the occurence of this disease is extremely controversial. Nevertheless in people of elderly and senile age there are different age morphological functional peculiarities of maxillodental apparatus determining clinical pictures of TMJ diseases and requiring proper correction. Thus carrying on this research is very actual and quite update.

The objective of the investigation performed within the program carried out by the RSE on the BRM « S.D. Asfendiyarov Kazakh National Medical University» it was studying the prevalence of clinical signs of TMJ disease in persons of middle, elderly and senile age of Almaty and Almaty oblast.

For this purpose, the epidemiological studies of 1,437 people (817 females and 620 males) and clinical studies of 493 persons (358 females and 135 males) were conducted. All 1437 respondents undergone epidemiological studies and were distributed in three age groups:

- middle-aged (49-59 years) - 609 people, of them 331 females, 278 males,
- elderly aged (60-74 years) - 553 persons, of them 307 females, 246 males
- senile aged (75 and over) - 275 persons, of them 179 females, and 96 males (table.1).
- Epidemiological studies revealed a variety of symptoms typical for functional disorders of TMJ. Occurence of these symptoms was controversial, but as a rule the appropriate dependence on their age and gender was not observed (Table 2)
- For example, 10.92% of persons complained of pain and discomfort in the TMJ area, 9.03% of them were of middle age, 11.57% of them - elderly aged ones, and already 16% were senile respondents. It's seen that the occurrence of such complaints increases with age. However, this increase may be associated with the secondary

degenerative changes (such as arthrosis, osteoarthrosis), which over time develop in functional disorders of a joint.

- The presence of clicks in the TMJ area on opening the mouth, typical for the joint dysfunction was observed in 9.6% of the respondents, moreover in middle and elderly aged persons their occurrence was at the same level (8.05% and 7.96%, respectively), but in senile aged ones it increased to 16.36% of the respondents.
- Occurrence of deviation of lower jaw when opening the mouth in all age groups was about at the same level (3.78%, 4.34% and 4.36% of cases).
- The frequency of "jamming" (blocking) of the joint did not change with ageing - in 3,61%, in 4,52% and in 4,73% of cases respectively.

Parafunctions in the form of clenching teeth, day and night time gnashing teeth, chewing without food were detected in 8.28% of cases, and their incidence clearly increased with ageing: in middle aged persons - 4.93% of cases, in elderly aged persons - 10.49% and in senile aged ones- 11.27%. This fact seems to be related to unsatisfactory fixing dentures. By clenching teeth they tried to fix the removable denture to the tissue of denture bed.

Obstruction and / or ring in ears occurred more frequently- in 27.7% of persons, moreover their occurrence gradually increased with age: in middle age- 17.41% of cases, in the elderly persons -34%, and in senile ones - 37, 82%. It is known that such symptoms are observed not only in pathology of TMJ (including in arthrosis), but also in various diseases of the elderly aged persons due to cerebrovascular and other vascular pathologies. However, in this context, it is believed that posterior displacement of TMJ head and compression of blood vessels going through Glazerov's fissure occurs when teeth are lost (especially the lateral group of teeth) and the height of occlusion gradually decreases with ageing.

Blood vessels and nerves providing innervation and blood supply to the organs of ear and TMJ, including the venous outflow from the hearing organs pass through Glazerov's fissure.

As can be seen, epidemiological studies have revealed a variety of symptoms typical for TMJ functional disorders of. Occurrence of majority of them did not correlate with age. The increase of occurrence depending on age related only to such symptoms as pain and discomfort in TMJ, para-functions, obstruction and / or ring in ears and grounds of it are given above.

Table 1. Respondents undergone epidemiological studies on their age and gender

| Age | Studies | Gender | | | | Total: | |
|---|---|---|---|---|---|---|---|
| | | Female | | Male | | | |
| | | abs.number | %% | abs.number | %% | abs. number | %% |
| 49-59 years | epidemiological | 331 | 40,51 | 278 | 44,84 | 609 | 42,37 |
| | *clinical* | *246* | *68,72* | *74* | *54,81* | *320* | *64,91* |
| 60-74 years | epidemiological | 307 | 37,58 | 246 | 39,68 | 553 | 23,13 |
| | *clinical* | *97* | *27,09* | *48* | *35,56* | *145* | *29,41* |
| 75-90 years | epidemiological | 179 | 21,91 | 96 | 15,48 | 275 | 24,89 |
| | *clinical* | *15* | *4,19* | *13* | *9,63* | *28* | *5,68* |
| Total : | epidemiological | 817 | 100,0 | 620 | 100,0 | 1437 | 100 |
| | *clinical* | *358* | *100,0* | *135* | *100,0* | *493* | *100,0* |

Table 2. Occurrence of TMJ pathology symptoms in the age aspect according to the results of epidemiological studies

| Age groups / Symptoms | | 45-59 years (609 people, males – 278 females - 331) | | 60-74 years (553 people, males – 246 females- 307) | | 75 years and over (275 people, males – 96 females - 179) | | Total (1437 people, males – 620 females - 817) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Abs. | %% | Abs. | %% | Abs. | %% | Abs.. | %% |
| Pain and discomfort in TMJ | Males | 17 | 6.11 | 32 | 13.01 | 18 | 18,75 | 67 | 10,80 |
| | Females | 38 | 11,48 | 32 | 10,42 | 26 | 14,53 | 96 | 11,75 |
| | **Total** | **55** | **9,03** | **64** | **11,57** | **44** | **16,00** | **163** | **10,92** |
| Click in TMJ area | Males | 20 | 7,19 | 27 | 10,97 | 18 | 18.75 | 65 | 10.48 |
| | Females | 29 | 8,76 | 17 | 5.54 | 27 | 15,08 | 73 | 8.93 |
| | **Total** | **49** | **8,05** | **44** | **7,96** | **45** | **16,36** | **138** | **9,60** |
| Crepitation inTMJ area | Males | 18 | 6,47 | 33 | 13,41 | 14 | 14,58 | 65 | 10,48 |
| | Females | 23 | 6,94 | 36 | 11,73 | 24 | 13,41 | 83 | 10,16 |
| | **Total** | **41** | **6,73** | **69** | **12,48** | **38** | **13.82** | **148** | **10,30** |
| Obstructed and / or ring in ears | Males | 44 | 15,83 | 76 | 30,89 | 35 | 36,46 | 155 | 25,00 |
| | Females | 62 | 18,73 | 112 | 36 ,48 | 69 | 38,54 | 243 | 29,74 |
| | **Total** | **106** | **17,41** | **188** | **34,00** | **104** | **37,82** | **398** | **27,70** |
| Deviation of the lower jaw | Males | 13 | 4,68 | 6 | 2,44 | 5 | 5,21 | 24 | 3,87 |
| | Females | 10 | 3,02 | 18 | 9,86 | 7 | 3,91 | 35 | 4,28 |
| | **Total** | **23** | **3,78** | **24** | **4,34** | **12** | **4,36** | **59** | **4,11** |
| "Jamming" a joint | Males | 8 | 2,88 | 12 | 4,88 | 2 | 2,08 | 22 | 3,55 |
| | Women | 14 | 4,23 | 13 | 4,23 | 11 | 6,15 | 38 | 4,65 |
| | **Total** | **22** | **3,61** | **25** | **4,52** | **13** | **4,73** | **60** | **4,17** |
| Diminished hearing and / or noise in ears | Males | 38 | 14,03 | 96 | 39,02 | 32 | 33,33 | 166 | 26,77 |
| | Females | 59 | 17,82 | 108 | 35,18 | 74 | 41,34 | 241 | 29,49 |
| | **Total** | **97** | **15,93** | **204** | **36,89** | **106** | **38,54** | **407** | **28,32** |
| Morning constriction of jaws | Males | 7 | 2,52 | 15 | 6,10 | 15 | 15,63 | 37 | 5,97 |
| | Females | 17 | 5,14 | 12 | 3,91 | 15 | 8,38 | 44 | 5,39 |
| | **Total** | **24** | **3,94** | **27** | **4,88** | **30** | **10,91** | **81** | **5,64** |
| Parafunctions | Males | 18 | 6,47 | 37 | 15,04 | 9 | 9,38 | 64 | 10,32 |
| | Females | 12 | 3,62 | 21 | 6,84 | 22 | 12,29 | 55 | 6,73 |
| | **Total** | **30** | **4,93** | **58** | **10,49** | **31** | **11,27** | **119** | **8,28** |
| Limitation of mouth opening | Men | 17 | 6,12 | 18 | 7,32 | 8 | 8,33 | 43 | 6,93 |
| | Females | 18 | 5,44 | 20 | 6,51 | 11 | 6,15 | 49 | 6,00 |
| | **Total** | **35** | **5,75** | **38** | **6,87** | **19** | **6,91** | **92** | **6,40** |

Table 3. Occurrence of symptoms of TMJ pathology in the age aspect according to the results of clinical studies

| Symptoms / Age | | 45-59 years (320 people.) | | 60-74 years (145 people.) | | 75 years and over(28 people) | | Total (493 people.) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Abs. | %% | Abs. | %% | Abs. | %% | Abs. | %% |
| Abrasion of teeth | | 55 | 17,18 | 29 | 20,00 | 3 | 10,07 | 87 | 17,65 |
| The nature of the defects of dentition | Complete loss of teeth | 26 | 8,12 | 30 | 20,69 | 8 | 28,50 | 64 | 12,98 |
| | terminal defects | 73 | 22,81 | 25 | 17,24 | 4 | 14,29 | 102 | 20,67 |
| | included | 5 | 1,56 | - | - | - | - | 5 | 1,56 |
| | combined | 216 | 67,50 | 90 | 62,07 | 16 | 57,14 | 322 | 65,30 |
| Not fixed occlusion | | 108 | 33,00 | 85 | 58,62 | 19 | 67,85 | 212 | 43,00 |
| Dentures,not corresponding to the requirements | | 182 | 56,00 | 95 | 65,52 | 20 | 71,43 | 297 | 60,24 |
| Click in TMJ area | | 14 | 4,38 | 5 | 3,45 | 2 | 7,14 | 21 | 4,26 |
| Displacement of the aesthetic center of jaws | | 248 | 77,00 | 102 | 70,34 | 24 | 85,71 | 374 | 75,86 |
| Deviation of the lower jaw | | 51 | 15,94 | 23 | 15,86 | 4 | 14,29 | 78 | 15,82 |
| Pain on palpation of a joint | | 17 | 5,31 | 6 | 4,14 | 3 | 10,7 | 26 | 5,27 |
| Crepitation in TMJ area | | 53 | 16,56 | 27 | 18,62 | 10 | 35,71 | 90 | 18,26 |
| Pain in other joins | | 77 | 24,06 | 30 | 20,69 | 4 | 14,29 | 111 | 22,51 |

Epidemiological studies failed to identify a clear relationship between the occurrence of symptoms of TMJ functional disorders and gender of the respondents. In general, a tendency to increasing the occurrence of symptoms in females is planned, but in different age groups that dependence was not observed.

Analysis of the occurrence of symptoms typical for TMJ inflammatory and dystrophic diseases (arthrosis, osteoarthrosis, chronic arthritis) found out that their incidence clearly increased with age (table 2). Crepitation in a joint was marked by 10.3% of the respondents, and their occurrence clearly increased with ageing: in middle age –6.73% of cases, in elderly age- in 12.48%, and in senile age - in 13.73% of the respondents..

A similar relationship was revealed with regard to such symptoms as diminished hearing and / or noise in ear: in middle age - 15.93 % in elderly age- 36.89 % and in senile age - 38.54 % of the respondents. As noted above, such symptoms (as well as obstruction and / or ring in ears in TMJ functional disorders) are considered to be due to the fact that with ageing in tooth loss (especially of lateral group of teeth) a posterior displacement of a joint and compression of blood vessels coming through Glazerov's fissure and providing venous outflow from the hearing organs occur.

Morning stiffness, typical for TMJ inflammatory and dystrophic diseases, was detected in 5.64 % of persons; moreover the obvious increase of its occurrence with ageing was also marked: in middle age - 3.94 % in elderly age - 4.88 %, and in senile age - 10.91 % of the respondents, that is almost 3 times more frequently than in middle age.

The limitation of mouth opening increased with ageing but not much clearly: in middle age - 5.75% in elderly age- 6.87%, and in senile age- 6.91% of the respondents.

Clinical studies were conducted in 493 persons (358 females, 135 males), divided into three age groups:

middle-aged (49-59 years) - 320 people, including 246 females, 74 males, elderly -aged (60-74 years) - 145 people,including 97 females,48 males and senile- aged (75 and over) - 28 persons,including 15 females, 13 males (table 1).

Since epidemiological studies did not reveal a clear dependence of occurrence of TMJ pathology symptoms on gender in middle, elderly and senile aged persons, the analysis of clinical trials was carried on without regard to gender of the examined persons (table 3).

Clinical studies (as well as epidemiological) found no definite correlation between age and the occurrence of symptoms typical for TMJ functional disorders.

Clicks in the joint area were detected in 4.26% of patients, and in senile age, as well as in epidemiological studies; they occurred almost 2-fold higher (7.14%) than in middle and elderly age.

The high prevalence of a constant symptom of TMJ dysfunction as jaws aesthetic center displacement (middle inter-incisor line) was marked in 75.86% of people, mostly in senile age (85.71%).

And finally, the most characteristic feature of TMJ functional disorders as a deviation of the mandible (S-or Z-shaped mouth opening) was revealed in 15.82% of the examined patients, and it occurred with the same frequency in all age groups (15.94%, 15.86 %, 15.86% of cases).

Abrasion of teeth resulting in a reduction of the height of occlusion, and, consequently, in the development of TMJ pathology was detected in 17.65 % of the examined persons, moreover the highest incidence was in elderly age - 20.69 %, and 2 times lower in senile age - 10.07% although a direct correlation between age and degree of abrasion of teeth is known. It should be noted that enamel strength, presence or absence of antagonists,, type of food (hard, soft), chewing duration, quality of orthopedic interferences affect abrasive process.

In 43 % of people occlusion was not fixed and the occurrence of that symptom increased with ageing: 33% - in middle, 58.62 % in elderly, and - 67.85 % in the senile age.

All the examined persons had defects of dentition.

Complete teeth loss was found only in 12.98 % of the examined persons, and mostly it was found in senile age - 28.5% of people, though it occurred in middle age - 8.12 %. Terminal defects of dentition were present in 22.67 % of persons but the highest index was in the middle age - 22.81 %, and with ageing those indices reduced: in elderly age- 17.24 %,in senile age - 14.29 % of people. The most frequent defects as combined ones were in 22.67 % of persons, and they were almost equally distributed in all age groups: in middle age - 67.50 %, in elderly age- 62.07 %,in senile age - 57.14 % of people. The included defects were detected only in the middle age - 56%.60.24% of persons' dentures required replacement.

The occurrence of symptoms typical only for inflammatory- dystrophic diseases as well as in epidemiological studies increased clearly with ageing.

Palpation of the temporal mandibular joint was painful in 5.27 % of cases, moreover in senile age it was observed 2 times more often (10.7 %) than in the middle (5.31 %) and elderly age (4.14%) that testified about higher incidence of osteoarthrosis in senile age.

On palpation crepitation of the joint area was found in 18.26 % of the patients and there was a clear correlation between the occurrence of that symptom with age: in middle age - 16.56 %, in elderly age - 18.62 %, in senile age - 35.71 % of the examined persons.

Pain in other joints was marked in 22.51% of the respondents, and there was an inverse correlation with age: in middle age - 24.06%,in elderly age- 20.69%, in senile age - 14.29% of the examined people.

***Discussion***

Epidemiological studies of middle, elderly and senile aged persons of Almaty and Almaty oblast demonstrated that from 4.11 % to 10.92 % of respondents had some or other symptoms of temporal mandibular joint functional disorders. Analysis of the epidemiological studies results didn't reveal any dependence of their occurence on gender. However, studies in children and young persons conducted earlier [ 10] found a higher occurrence of those symptoms in females - 61.78 % than in males - 38.21 %, that was confirmed by the data of several authors conducting the study in the young people [ 8-11].

According to the results of clinical trials the occurrence of symptoms typical for TMJ dysfunction, ranged from 4.26 % to 15.82 %, that was slightly lower than the data of literature, according to which the various features of TMJ dysfunction were present in 14-40 % and even in 19-63 % of population. In this case, adolescents [2,3,4 ] compose a significant part (35-40 %) but our studies dealt with the middle, elderly and senile aged persons. Besides our previous studies of 442 patients with pain dysfunction syndrome at the age from 16 to 72 years showed that persons over 50 years old accounted only 14.9 % (11) of them.The above mentioned information explains our obtained data, especially, the decreasing of functional disorders symptoms occurrence of the examined group of population. It's seen that there is an adaptation of the dentition to factors causing TMJ

dysfunction (such as loss of teeth, reducing the height of occlusion, masticatory muscle tone imbalance, ageing dysfunction of chewing and mimic muscles, irrational dental prosthetics, etc.) in the elder age groups (equally in both men and women). As a result of it a lower jaw, " accustoms " to a new, alternative position, by which the high incidence of the jaws aesthetic center displacement, revealed in respondents of elderly and senile age, may be explained.

The data concerning the symptoms of TMJ inflammatory and dystrophic diseases in the middle and senile aged inhabitants of Almaty and Almaty oblast are little different. The analysis of epidemiological and clinical studies results have shown that from 5.64 % to 26.93 % of the respondents had certain symptoms of TMJ inflammatory and dystrophic diseases. Their occurrence (unlike TMJ functional disorders) clearly increased with ageing. Any dependence of inflammatory and dystrophic diseases symptoms occurrence on gender was not revealed and those symptoms occurred equally in males as well as in females.

According to the results of clinical trials, the occurrence of all the identified symptoms of TMJ inflammatory and dystrophic diseases (pain on palpation of a joint, crepitation in the TMJ area, abrasion of teeth, etc.) also had a clear direct dependence on age. All the 493 examines persons (100 %) had a variety of dentition defects, which correspond to the literature data. 94,6-98,2 % of persons aged 60 years and over need orthopedic aid. In 89 % of elderly and senile aged patients there were defects of lateral groups of dentition predominantly bilateral terminal defects [12]. Incidence of complete loss of teeth increased with ageing. In relation to other types of dentition defects such dependence was not found. The dentures of 60.24 % of the examined persons didn't meet the requirements and needed replacement, which also corresponds to the literature data [13].

Tooth loss in elderly and senile aged persons cause ageing atrophic changes in jaw bones. However, it should be noted that atrophic and dystrophic processes in jaws aggravate due to unequal distribution of mastication pressure, and it is resulted from irrational and not qualitative teeth prosthesis. That is why, detection of TMJ pathology and dentition defects in time in middle, elderly and senile age is of a great social value.


| ФИО | Должность | Ученая степень | e-mail | Контактные телефоны |
|---|---|---|---|---|
| Ибрагимова Роза Сафиулловна | профессор кафедры интернатуры КазНМУ | доктор мед. наук, профессор | r_ibrag.@mail.ru | 87772618002 |
| Мирзакулова Улмекен Рахимовна | руковод. модуля пропедевтики хирургической стоматологии КазНМУ | доктор мед. наук, доцент | ulmeken@inbox.ru | 87013780011 |
| Космаганбетова Алма Темирхановна | ассистент модуля пропедевтики хирургической стоматологии КазНМУ | канд. мед. наук | alma__68@mail.ru | 87028501162 |
| Искакова Мариям Козбаевна | доцент кафедры интернатуры КазНМУ | канд. мед. наук | Marya_iskakova@mail.ru | 87772226265 |
| Жартыбаев Рахмет Нокеевич | Зав. кафедрой интернатуры КазНМУ | доктор мед. наук, профессор | stominwest@mail.ru | 87772107591 |


***Conclusion.***

1. Occurrence of TMJ functional disorders symptoms in middle, elderly and senile aged residents of Almaty and Almaty oblast, identified by epidemiological studies, ranged from 4.11% to 10.92% of cases. They were revealed by clinical studies in 4.26% -17.65% of the examined persons.
2. Occurrence of TMJ functional disorders symptoms in the examined patients had no clear dependence on age and gender.

3. The incidence of different symptoms typical for inflammatory and dystrophic diseases of temporal mandibular joint in population of Almaty and Almaty oblast of middle, elderly and senile age, identified by epidemiological studies ranged from 5.64% to 26.93% of cases. They were found by clinical studies in 5.27% -18.26% of patients.
4. Occurrence of TMJ inflammatory and dystrophic diseases symptoms in middle, elderly and senile aged persons, as revealed by epidemiological and clinical studies clearly increased due to age.
5. All the examined persons had dentition defects and 34.08% of them had complete loss of teeth and terminal defects that contribute to the onset and development of pathology of temporal mandibular joint, which enables us to consider that fact as a serious medical and social problem.

**List of references**:


1. Akanov A.A, Tulebayev K.A, Tretyakova S.N. To the issue about methods of studying the ageing process in Kazakhstan. // Proceedings of the jubilee scientific conference with international participation. Actual problems of gerontology and geriatrics. - St. Petersburg, MAPS, -2011,- p.285-286.
2. Puzin M.N., Vyazmin A.Ya. The painful dysfunction of the temporal mandibular joint. Moscow: Medicine, 2002. - 158 p.
3. Pissarevskiy Yu.L,. Semeniuk V.M., Hyshitkuyev B.S., Belokrinitskaya T.Ye. Syndrome of pain dysfunction of the temporal mandibular joint in women (clinical picture, diagnosis, treatment). - Moscow: Medical Book, Nizhniy Novgorod: Publishing NGMA, 2003. – 105p.
4. Weinman A., Agerberg G. Mandibular disfunction in adolescents //Acta Odontol. Scand. – 1986. – Vol. 44. № 1. – P. 55-62.
5 Magnusson T., Egemark-Eriksson J., Carlsson G. //J. Craniomandib. Pract. – 1986. – Vol. 4, № 4. – P. 338-402.
6. Eversol L.R., Machado L. Temporomandibular joint internal derangements and associated neuromusculaar disorders // J. Am. Dent. Assoc. – 1985. Vol. 110, №1. – P. 69-79.
7. Molin C. From bite to mind: TMD a personal and literature review //Int. J. Prosthodont. – 1999. – Vol. 12, № 3. – P. 279-288.
8. Gavish A., Halachmi M., Winocur E., Gazit E. Oral habits and their association with signs and symptoms of temporomandibular disorders in adolescent girls // J. Oral. Rehabil. – 2000. – Vol. 27, № 1. – P. 22-32.
9. Raphael K.G., Marbach J.J. Comorbid fibromyalgia accounts for reduced fecundity in women with myofascial face pain // Clin. J. Pain.–2000.– Vol. 16, № 1. – P. 29-36.
10. Ibragimova R.S.,.Bakayeva A.M., Fiodorov D.Ye., Ussova N.F., Yakushenko V.M.. // Prevalence of functional disorders of the temporal mandibular joint in children, adolescents and persons of young age. - Bulletin of the Kazakh National Medical University. - 2012 - № 1
11. Ibragimova R.S. Diagnosis and treatment of pain dysfunction syndrome of the temporal mandibular joint by using alternative methods. / / Dissertation for the degree of Doctor of Medicine. - Almaty. - 2006. - 270 p.
12. Aryev A.L., Soldatova L.N., Soldatov S.V., Iordanishvili A.K. Dental morbidity of elderly and senile aged persons / / Bulletin of the S.M. Kirov Russian Military medical academy. - 2007. Number 1 (17). - App., 4.1. - P. 20-21.
13. Apresyan G.N. Need in the orthopedic and dental aid to the population of elderly and senile age and peculiarities of its rendering under the conditions of free (grace) dental prosthesis. / / Dissertation for the degree of Doctor of Medicine. - Moscow. - 2005. – 92 p.


1/9/2014