

ARTICLE

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**ICF DOMAINS IN THE ASSESSMENT
OF THE DENTAL SYSTEM AND RELATED PROCESSES
IN YOUNG, MIDDLE AND OLD RESIDENTS OF BISHKEK****¹Subanova A.A., ²Seitov T.S., ³Belov G.V., ⁴Kalbaev A.A., ²Ismailov A.A.**¹*Kyrgyz-Russian Slavic University, Kyrgyzstan, Bishkek, e-mail: az_subanova@mail.ru;*²*Osh State University, Osh, e-mail: tseitov@mail.ru, osumbekov@oshsu.kg;*³*International university of Kyrgyzstan, Bishkek, e-mail: georgybelov54@gmail.com;*⁴*Kyrgyz state medical academy, Bishkek, e-mail: kalbaev_abibulla@mail.ru*

The authors assessed the condition of the dentition in 200 young, middle-aged and elderly residents of Bishkek using the ICF domains. The severity of the domains was compared with the traditional diagnostic methods used in stomatology based on visual examination of the oral cavity, cytological examination of smears-prints of the gingival mucosa, determination of the total microbial number, biochemical examination of saliva, and the contents of the gingival canals. Studied 20 domains, of which 7 domains of structure, 6 domains of function, 4 domains of activity and participation, as well as 3 domains of environmental factors. Results. Changes were revealed even at a young age. In this group, violations were noted with a frequency of 4% to 30% for all studied domains. Their severity was less than in middle and old age. With gingivitis, there is a significant increase in the indicators of periodontal indices and the expression of ICF domains. Bishkek residents of all three age groups in about half of the cases did not note financial difficulties for the treatment and prosthetics of teeth, while talking about the possibilities of only inexpensive prosthetics. Conclusion. The use of ICF domains provides a universal tool for assessing the condition of the dentition and associated processes in various continents of healthy individuals and dental patients, as well as for assessing the effectiveness of their rehabilitation.

Keywords: ICF, teeth, gums, age

In recent years, the International Classification of Functioning, Disability and Health (ICF) has become a universal tool for scientific research in medical rehabilitation, medical ecology [1, 2]. This is typical not only for medicine in general, and in particular for dentistry [3, 4]. In Kyrgyzstan, the importance of using the ICF is still being discussed [5, 6].

The ICF evaluates health (or the degree of its limitation) as a dynamic state consisting of six categories: function, structure, activity and participation, environmental factors and personality factors.

The ICF was first proposed by WHO in 2001. Today the concept of the ICF continues to evolve. Categories are made up of domains that can be quantified in terms of severity from 0 to 4. O – NO violations, 1 – Mild violations, 2 – MODERATE violations, H – SEVERE violations, 4 – ABSOLUTE violations.

The number of domains is more than 1500. The criteria for the expression of domains in publications are enriched with new parametric and non-parametric indicators. Regardless of the units of measurement of a particular indicator (mmol-equiv. / L, nm, mm Hg, etc.), shifts of any domain are expressed in points that are easily readable both for population groups and for an individual. Particularly statistically significant changes are obtained with two or more measurements, for example: before and after the course of rehabilitation [7].

The aim of this study was to assess the functioning of the dentition and lust system and the processes associated with it in young, middle-aged and elderly residents of the city of Bishkek by ICF domains.

Materials and methods of research

The assessment of the functioning of the dentoalveolar system and related processes in young, middle-aged and elderly residents of the city of Bishkek by ICF domains was carried out.

The first group consisted of 100 students and young employees of medical and preventive institutions aged 17 to 25 years. The average age is 23.42 ± 1.3 years. Secondary special education or incomplete higher education.

The second group consisted of their parents (average age – 53.94 ± 3.2 years, the third of their grandparents (average age – 70.58 ± 3.4 years).

All three groups lived in similar housing and socio-economic conditions.

Of the 1,500 ICF domains, about 50 domains have already been used to assess health status in dentistry. We selected 20 domains for the survey, of which 9 domains of the s3200 structure – the structure of itching (s32001 – the presence of teeth, s32002 – the severity of caries, s32003 – the number of filled teeth, s32004 – plaque, tartar, odor), s3201 – gum structure (bleeding, hypersensitivity, the presence of gum pockets), s3202 – alveolar processes, s3203 – tongue, s3204 – lip structure.

Table 1

Criteria for the severity of changes in ICF domains when assessing the dentition

| № | Domain | 0 | 1 | 2 | 3 | 4 |
|----|---|-------------------|----------------------------------|--------------------------------|---|--|
| 1 | s3200 (1) – presence of teeth | All their | 20-28 | 10-19 | 5-9 | No teeth |
| 2 | s3200 (2) – number of carious teeth | No | 2 teeth | 3 – 4 teeth | 4 – 6 teeth | 6 and more teeth |
| 3 | s3200 (3) – Number of filled teeth | No | 2 teeth | 3 – 4 teeth | 4 – 6 teeth | 6 and more teeth |
| 4 | s3200 (4) -Presence of overlaps, tartar, odor. | No | Yes some-times | constantly | I cover my mouth with my hand | I am not approaching the interlocutor |
| 5 | s3201-gums: bleeding, increased sensitivity | No | sometimes | often | constantly and this creates problems | Severe problems |
| 6 | b28018- toothache | No | sometimes | often | constantly | unbearable pain |
| 7 | b5102 – problems with chewing | No | only solid food | bread, apples | any food some-times | any food always |
| 8 | b5101 – biting problems | No | only a certain tooth | only a certain row of teeth | yes, for any position sometimes | yes, for any position is always |
| 9 | d5201 – Oral Care | No problems daily | Not always | sometimes | No conditions | I can't physically |
| 10 | d6208 – financial possibilities of prosthetics, treatment | No problems | There is for expensive services | only inexpensive front | I don't have to prose | do not have for treatment and prevention |
| 11 | d3300 – pronunciation of sounds | No | For sibilants and sibilants only | Quiet speech | Inarticulate speech | Non-segregated speech |
| 12 | d3301 – Limitations of Fast Speech | No | there is weak | moderate | strong | I use gestures |
| 13 | e498 – personal aesthetic perception of the state of the oral cavity, smile | No | a little in front of strangers | yes, even with familiar people | I cover my mouth with my hand or a handkerchief | I cry when I look in the mirror |

There were 6 domains of function: b28018 toothache, b5102 – problems with chewing, b5101 – problems with biting, b5105 – swallowing, b7408 – endurance of the chewing muscles, b7108 – mobility of the TMJ. The domains of activity and participation were d5201 – oral care, d550 – eating, d560 – drinking, d 5702 – taking care of one's own health, d6208 – purchasing goods and services (financial possibilities of prosthetics, treatment). Environmental factors included the domains e1151 for orthopedic constructions, e355 for attention from medical professionals, and e498 for personal aesthetic perception of the oral cavity.

The severity of changes in each domain was assessed quantitatively in points from 0 to 4 (Table 1).

Evaluation of ICF domains was compared with traditional diagnostic methods used in dentistry [8] based on visual examination of the oral cavity, cytological examination of smears-prints of the gingival mucosa, determi-

nation of the total microbial number, biochemical examination of saliva, and the contents of the gingival canals. ICF uses all of these indices and indicators to determine the severity of domains, not rejecting, but based on them.

For comparison, we determined the hygienic index of L.V. Fedorova, gingival index GI (Loe, Silness), bleeding index, gingivitis index, index of periodontal disease. In this case, plaque and tartar are taken into account, the depth of the dento-gingival pocket is measured with a graduated probe from the enamel-cement junction to the bottom of the pocket.

The advantage of the ICF is its versatility and convenience of statistical processing both for assessing different population groups and for the dynamics of the state of health in an individual individual.

Data analysis was performed by the program of statistical information processing – Excels and SPSS Statistics 20.

Table 2

The severity of domains in young, middle-aged and elderly residents of Bishkek

| № | Домен | Group 1 | Group 2 | Group 3 |
|----|---|--------------|--------------|--------------|
| 1 | s32001 – the presence of teeth | 0,576±0,087 | 2,278±0,432 | 2,432±0,335 |
| 2 | s32002 – severity of caries | 0,730±0,091 | 0,556±0,12 | 0,432±0,086 |
| 3 | s32003 – Number of filled teeth | 1,756±0,088 | 1,389±0,092 | 1,567±0,107 |
| 4 | s32004 – Presence of deposits, tartar, odor | 0,769±0,103 | 1,056±0,105 | 0,578±0,123 |
| 5 | s3201- gums: bleeding | 0,385±0,067 | 0,833±0,098 | 0,522±0,073 |
| 6 | b28018 – Toothache | 0,373±0,055 | 0,611±0,094 | 0,432±0,076 |
| 7 | b5102 – problems with chewing | 0,423± | 0,833± | 0,75±7 |
| 8 | b5101 – biting problems | 0,076± | 1,111± | 0,730± |
| 9 | d3300 – pronunciation of sounds | 0,075±0,012 | 0,389±0,056 | 0,432±0,085 |
| 10 | d3301 – Limitations of Fast Speech | 0,115±0,044 | 0,5±0,084 | 0,324±0,076 |
| 11 | d5201 – Oral Care | 0,625±0, 112 | 0,594±0, 101 | 0,545±0, 203 |
| 12 | d550 – food intake | 0,05±0,030 | 0,720±0,1 | 0,833±0, 153 |
| 13 | d 5702 – taking care of your own health | +0,52±0,09 | +0,889±0,111 | +1,724±0,022 |
| 14 | d6208-financial possibilities of prosthetics, treatment | 0,538±0,078 | 0,667±0,112 | 0,459±0,066 |
| 15 | e1151 – presence of crowns, bridges, orthopedic structures | +0,231±0,067 | +0,889±0,124 | +0,784±0,022 |
| 16 | e498 – personal aesthetic perception of the state of the oral cavity, smile | 0,423±0,075 | 0,333±0,049 | 0,216±0,054 |

Results of the research and discussions

In this population of young people, all studied domains were noted with a frequency of 4% to 30%. Their severity was less than in groups 2 and 3 (Table 2).

Thus, the severity of the s3200.1 domain – the presence of teeth increased by 0.576 ± 0.087 in the first group to 2.432 ± 0.335 ($p < 0.001$). The reason for the decrease in the number of teeth, 2 people noted injuries, 2 previous caries. Domain s32002 – the severity of caries was the highest in group 1 in young people (0.730 ± 0.091). This indicates a frivolous attitude of young people to their health, they do not pay attention to the initial signs of the disease. This is confirmed by changes in domains d 5702 – taking care of one's own health, d5201 – taking care of the oral cavity, which were also lower than in older age groups. In addition, a smaller number of carious teeth in elderly people may be associated with a smaller number of their teeth in this group, the use of crowns, bridges and other orthopedic structures. Domain s32003 – the number of filled teeth in young people turned out to be very high, which indicates the urgency in Kyrgyzstan of the problem of caries at the age of ships, noted by many authors. In quantitative terms, only 45% of the examined did not have carious and filled teeth. In the third and third groups, the s32003 do-

main decreased as repeatedly filled teeth were either covered with crowns or removed. Domain s32004 – the presence of overlays, tartar, odor was noted in 22% of young people, in 40% of middle-aged and elderly people. The expression of the domain in group 1 was significantly lower than in the second ($p < 0.05$), but not lower than in the third.

The domain of gingival structure s3201 (bleeding, increased sensitivity, the presence of gingival pockets) in young people was at a low level of 0.385 ± 0.075 , significantly differing from middle-aged people; in the elderly, the domain was also lower than in the middle, which we explain by less the number of teeth in the respondents of the 3rd group.

Domain of function b28018 – toothache was sometimes noted in 21% of the respondents in the first group, its severity (0.383 ± 0.058) was not significant, significantly lower than in the second group.

Problems with chewing (b5102) of solid food were noted by about a quarter of young people; the severity of the domain was significantly lower than in the second and third groups. In the absence of a significant number of teeth in the elderly, the chewing function was compensated by the use of orthopedic structures, which was noted by 72% of the respondents of the 3rd group.

The most striking difference was in the expression of the b5101 domain – biting problems. Only one respondent from group 1 noted minor problems that were associated with the originality of the bite. In the second group, the domain size was 14 times higher than in the first. In the third group, a low level of problems was solved through the use of adequate orthopedic structures.

We did not identify problems with swallowing (b5105) in these surveyed groups; also, only three respondents noted fatigue of the masticatory muscles (b7408), so we will not deal with these domains yet, although with some injuries of the face and neck, as well as general somatic diseases, changes in these domains may have a certain biological basis.

The domains of activity and participation can also change in dental pathology.

Lips, teeth, tongue, palate take part in voice formation. Domains d3300 – problems with pronunciation of sounds and d3301 – restrictions on fast speech were close to zero among the respondents of the first group. In the second and third groups, these domains were significantly higher than in the first, but weak in severity, and usually concerned the pronunciation of hissing and whistling sounds.

Domain d5201 – oral care had no statistically significant changes by age group. Here, environmental factors can be of greater importance – for example, a shortage of drinking water and personal factors – untidiness. Significant problems can arise with general somatic and mental illnesses, for example: cerebral palsy, rheumatoid arthritis, post-stroke period, oligophrenia, etc.

Also, such diseases can create problems in the d550 domains – food intake and d 5702 – taking care of your own health.

In the surveyed contingents (relatively healthy individuals without general somatic and mental illnesses), the dependence of the d550 and d 5702 domains on age was revealed. Young people had absolutely no problems with food intake. Whereas in the middle and older age they were present, but they were not pronounced, since they were compensated by the methods of cooking to a soft, semi-liquid and jelly-like consistency. Their meat is used in the form of minced meat, thin cuts. On the other hand, the problems were solved through the use of orthopedic structures.

Taking care of their own health among young people is not put in the first place, and is mainly reduced to playing sports, visiting health centers, beauty parlors. In old age, more

attention is paid to taking care of one's own health, this is a visit to doctors, taking dietary supplements and preventive and maintenance doses of medications, adherence to a diet, more thorough hygiene measures, morning exercises. Middle-aged working people have an understanding of the importance of maintaining health, but they cannot devote much time to this. The d 5702 domain, as our studies showed, progressively significantly increased from the first to the third group.

Bishkek residents of all three age groups in about half of the cases did not note financial difficulties for the treatment and prosthetics of teeth (domain d6208), while talking about the possibilities of only inexpensive prosthetics.

The difference in the magnitude of this domain in students with all their teeth, albeit partially carious, and in pensioners, with crowns and prostheses, turned out to be statistically insignificant ($p > 0.05$). But it is not medical, but personal factors that matter. Students will spend their last money on a new thing or a party, and they will endure pain. The pensioner will refuse to buy things in order to have money for treatment.

Domain e498 – personal aesthetic perception of the state of the oral cavity, smiles in our study showed that the absence of a row of teeth, the presence of dentures, wrinkled lips for the elderly are not an important problem, on the contrary, young people, especially girls, can get hung up on their appearance, with healthy teeth to be embarrassed by your smile, dream of cosmetological operations. In general, the e498 domain was poorly expressed in all groups.

Conclusions

1. The use of ICF domains provides a universal tool for assessing the state of the dentition and associated processes in various contingents of healthy individuals and dental patients, as well as for assessing the effectiveness of their rehabilitation.

2. With gingivitis, there is a significant increase in the parameters of periodontal indices and the severity of ICF domains, depending on age.

References

1. Castronovo G., De Palo A., De Cicco D. Implementation of the ICD-ICF model in rehabilitation medicine: report of a clinical case in neuromotor rehabilitation. *G Ital Med Lav Ergon.* 2019 May. № 41(2). P. 156-161.
2. Stucki G., Zampolini M., Selb M., Ceravolo M.G., Delargy M., Varela Donoso E., Kiekens C., Christodoulou N. Study Group European Framework of Rehabilitation Service Types. *European Framework of Rehabilitation Services Types: the per-*

spective of the Physical and Rehabilitation Medicine Section and Board of the European Union of Medical Specialists. *Eur J Phys Rehabil Med.* 2019 Aug. № 55(4). P. 411-417. DOI: 10.23736/S1973-9087.19.05728-9.

3. Filyuk S.A., Kochubei A.V. ICF and its application in dentistry // *Russian dental journal.* 2012. No. 2. S. 55-56.

4. Leidler S.A., Kochubei A.V. Application of the international classification of functioning, disabilities and health (ICF) in the provision of orthopedic dental care. *Bulletin of Roszdravnadzor.* 2014. № 1. S. 44-47.

5. Belov G.V. On the prospects of using the international classification of functioning, disability and health in the medical science of Kyrgyzstan. *Bulletin of Osh State University.* 2017. No. 4. S. 68-73.

6. Belov G.V., Firsov S.A., Dzhenbaev E.S., Makhmadiev A.K., Sherieva N.K. The value of the international classification of functioning, disability and health for traumatology and medical rehabilitation in Kyrgyzstan. *Medicine of Kyrgyzstan.* 2015. No. 6. P. 26-31.

7. Prodinge B., Scheel-Sailer A., Escorpizo R., Stucki G. UEMS PRM ICF Workshop moderators and rapporteurs. European initiative for the application of the International Classification of Functioning, Disability and Health: development of Clinical Assessment Schedules for specified rehabilitation services. *Eur J Phys Rehabil Med.* 2017 Apr. № 53(2). P. 319-332. DOI: 10.23736/S1973-9087.16.04438-5.

8. Grudyanov A.I. *Diagnostics in periodontics.* M.: Med. inform. agency, 2004. 104 p.