УДК 616.314-08: 614.2
МРНТИ 76.29.55

# ASSESSMENT OF QUALITY OF LIFE AMONG PEOPLE AFTER PROSTHETIC OR PERIODONTAL TREATMENTS (LITERATURE REVIEW)

**L.S. HARUTYUNYAN, A.E. TADEVOSYAN**

Yerevan State Medical University after Mkhitar Heratsi, Yerevan, Armenia

Harutyunyan L.S. – https://orcid.org/0000-0001-7737-2978
Tadevosyan A.E. – https://orcid.org/0000-0001-7157-947

Citation/
Библиографиялық сілтеме/
Библиографическая ссылка:

Harutyunyan LS, Tadevosyan AE. Assessment of quality of life among people after prosthetic or periodontal treatments (literature review). West Kazakhstan Medical Journal 2019;61(3):154–162.

Арутюнян ЛС, Тадевосян АЭ. Протездеуден немесе пародонтальды емдеуден кейінгі науқастардың өмір сапасын бағалау (әдебиетке шолу). West Kazakhstan Medical Journal 2019;61(3):154–162.

Арутюнян ЛС, Тадевосян АЭ. Оценка качества жизни больных после протезирования или пародонтального лечения (обзор литературы). West Kazakhstan Medical Journal 2019;61(3):154–162.

**Assessment of quality of life among people after prosthetic or periodontal treatments (literature review)**
L.S. Harutyunyan, A.E. Tadevosyan
Yerevan State Medical University after Mkhitar Heratsi, Yerevan, Armenia

**Purpose.** Partial edentulousness and periodontal diseases may play an important role in person's quality of life. The purpose is to investigate oral health related quality of life after treatment of partial edentulousness by means of implant-supported and tooth-supported dentures and periodontal treatment by reviewing the literature.
**Methods.** A literature search of MEDLINE (Pub-Med) and other Internet source through electronic and hand searching was performed. Overall 677 studies were viewed. Included studies were divided into two groups: assessment of OHRQoL after implant and tooth-supported prosthetic treatment (first group) and after non-surgical and surgical periodontal treatment (second group).
**Results.** In the first group 5 studies assess quality of life changes depending on type of prosthesis used. Variability was found in age, tooth position, and number of teeth being replaced. In the second group 12 studies reported improvements in OHRQoL after periodontal therapy was detected after non-surgical and surgical treatments.
**Conclusion.** Within the limits of the available literature 5 types of validated OHRQoL questionnaires were used. In the first group tooth-supported and implant-supported fixed dentures had positive effects on OHRQoL. Implant-supported fixed dentures showed greater short-term improvement than tooth-supported fixed dentures. In the second group studies reported a statistically significant improvement in OHRQoL after non-surgical treatment. No differences were reported between different forms of non-surgical treatment. Surgical therapy had a relatively lower impact on OHRQoL. A correlation between poor clinical response to therapy and poor OHRQoL outcomes was observed. Oral health related quality of life was affected by clinically assessed periodontal diseases. Routine non-surgical therapy can moderately improve the OHRQoL in adults with periodontal disease.
Thus, in US and in different countries different questionnaires are used assessing oral health-related quality of life. Still there is no unique questionnaire or method for life quality assessment of dental patients. This, of course, is influenced by cultural diversity, ethnic values and other factors.
***Keywords:*** *quality of life; oral health impact factor; periodontal disease; partial edentulousness; implant-supported restoration.*

**Протездеуден немесе пародонтальды емдеуден кейінгі науқастардың өмір сапасын бағалау (әдебиетке шолу)**
Л.С. Арутюнян, А.Э. Тадевосян
М.Гераци атындағы Ереван мемлекеттік медицина университеті, Ереван, Армения

**Мақсаты.** Жартылай адентия мен парадонта ауруы адамның өмір сапасында маңызды рөл атқарады. Бұл жұмыстың мақсаты имплланттар мен тістерге тіреуі бар тіс протездерін қолдана отырып, жартылай адентияның емінен кейінгі пациенттердің өмір сапасын, сондай-ақ әдебиетке шолу әдісімен пародонтальды емдеудің сапасын зерттеу болып табылады.
**Әдістер.** Әдебиеттерді іздеу MEDLINE (PubMed) порталында және басқа дереккөздерде (disserCat) жүргізілді. Шолу зерттеу 677 мақалада жүргізілді.

Арутюнян Л.С.
*e-mail: luys_harutyunyan@yahoo.com*

Received/
Келіп түсті/
Поступила:
26.06.2019

Accepted/
Басылымға қабылданды/
Принята к публикации:
25.09.2019

*ISSN 1814-5620 (Print)*

*Published by West Kazakhstan Marat Ospanov Medical University*

Бастапқы сараптаудан кейін таңдалып алынған мақалалар екі топқа: бірінші топ – имплантар мен тістерге тіреуі бар протетикалық емдеуден кейінгі өмір сапасын бағалау; екінші топ – хирургиялық емес және хирургиялық пародонтальды емдеуден кейінгі өмір сапасын бағалау.
**Қорытынды.** Бірінші топ зерттеуінде өмір сапасының өзгерісі қолданылған протездерге байланысты бағаланды. Айырмашылықтар пациенттің жасына, қалпынан келтірілген тістерінің санына т.б. байланысты болды. Екінші топта пациенттердің өмір сапасының жақсаруы хирургиялық емес және хирургиялық пародонтальды емдеуден кейін байқалды.
**Түйін.** Қолда бар әдебиеттерде сауалнаманың 5 түрі қолданылды. Әдеби шолу тістерде де, имплантарда да тіректері бар алынбайтын протездер науқастардың өмір сапасына жағымды әсер ететіндігін көрсетті. Алайда имплантарға тірегі бар алынбайтын протездер тістерге тірегі барларға қарағанда науқастың жағдайының неғұрлым жылдам жақсаруын қамтамасыз етеді. Хирургиялық емес пародонтальды емдеуден кейін зерттеулер науқастар өмір сапасының жақсарғанын статистикалық нақты көрсетті. Хирургиялық емес емдеудің әртүрлі формаларының арасында айырмашылық байқалмады. Дұрыс емдеуде хирургиялық емдеу аз деңгейде және уақытша өмір сапасына әсер етеді. Пародонтальды емдеуге жағымсыз әсер мен өмір сапасын өлшеудің төмен нәтижелерінің арасындағы байланыс анықталды. Күнделікті хирургиялық емес емдеу пародонтальды емдеуден кейінгі өмір сапасын едәуір жақсарта алады.
Алайда АҚШ-та және басқа елдерде әртүрлі сауалнамалар ауыз қуысы денсаулығымен байланысты өмір сапасын бағалау үшін қолданылады. Әзірге стоматологиялық пациенттердің өмір сапасын өлшеудің бірыңғай сауалнамасы немесе әдісі жоқ. Оған сондай-ақ мәдени әртүрлілік, этникалық құндылықтар және басқа факторлар әсер етеді.
***Негізгі сөздер:*** *өмір сапасы, ауыз қуысы саулығына әсер ету факторы, парадонта ауруы, жартылай адентия, имплантаға тірегі бар қалпына келтіру.*

**Оценка качества жизни больных после протезирования или пародонтального лечения (обзор литературы)**

Л.С. Арутюнян, А.Э. Тадевосян
Ереванский государственный медицинский университет им. М. Гераци, Ереван, Армения

**Цель.** Частичная адентия и заболевания пародонта играют важную роль в качестве жизни человека. Цель данной работы исследовать качество жизни пациентов после лечения частичной адентии с использованием зубных протезов с опорами на импланты и на зубы, а также пародонтального лечения методом обзора литературы.
**Методы.** Поиск литературы был произведен в портале MEDLINE (PubMed) и других источниках (disserCat). Обзорное исследование проводилось у 677 статей. После начального анализа выбранные статьи делились на две группы: первая группа – оценка качества жизни после протетического лечения с опорами на импланты и на зубы; вторая группа – оценка качества жизни после не хирургического и хирургического пародонтального лечения.
**Результаты.** В исследованиях первой группы изменения качества жизни были оценены в зависимости от использованных протезов. Разницы зависели от возраста пациента, количеств восстановленных зубов и т.д. Во второй группе улучшения в качестве жизни пациентов были определены после не хирургического и хирургического пародонтального лечения.
**Заключение.** В имеющейся литературе были использованы 5 типов опросников. Обзор литературы показал, что на качестве жизни больных позитивно влияют несъемные протезы с опорами, как на зубы, так и на импланты. Однако несъемные протезы с опорами на импланты обеспечивают более быстрое улучшение состояния больного, чем с опорами на зубы. После нехирургического пародонтального лечения исследования статистически достоверно показали улучшение качества жизни больных. Между разными формами нехирургического лечения разницы не наблюдалось. При грамотном лечении хирургическое лечение в меньшей степени и временно ухудшает качество жизни. Была определена связь между плохой реакцией на пародонтальное лечение и низкими результатами измерения качества жизни. Рутинное нехирургическое лечение может умеренно улучшить качество жизни после пародонтального лечения.
Однако в США и других странах используются разные опросники для оценки качества жизни связанного со здоровьем полости рта. Пока еще нет единого опросника или метода измерения качества жизни стоматологических пациентов.

На это влияет также культурное разнообразие, этнические ценности и другие факторы

***Ключевые слова:*** *качество жизни, фактор воздействия на здоровье полости рта, заболевание пародонта, частичная адентия, реставрация с опорой на импланты.*

**Introduction**

In 1946 the World Health Organization defined health as a "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity", and three decades later it was recommended to include patients' perception of impairment in the diagnosis and characterization of diseases [11]. This shift from a medical, strictly biological model to a socio-environmental model including function, psychological and social well-being was subsequently applied in dentistry [2, 3]. WHO defines Quality of Life as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment [4].

Among the concept of general health, the oral health has its own place. Oral health is a functional, structural, aesthetic, physiologic and psychosocial state of well-being and is essential to an individual's general health and quality of life [5, 6]. Oral health is affected by many factors, among which periodontal diseases play an enormous role.

Periodontal diseases (PD) are common and highly prevalent chronic diseases worldwide [7, 8] and are known to impair systemic health in susceptible individuals with for instance metabolic, atherosclerotic cardiovascular, and rheumatoid diseases, as well as aspiration pneumonia [9, 10, 11].

Patient-based outcomes (PBOs) or "true endpoints" are subjective measures which capture patients' perspectives of disease or therapy and complement conventional clinical (surrogate) measures [12, 13]. Traditionally, periodontal disease has been defined and measured using objective markers, most commonly – pocket probing depth (PPD) and clinical attachment loss (CAL) [14, 15, 16]. Oral health-related quality of life (OHRQoL) is one PBO, and is recognized as an integral part of general health and well-being [17, 18]. Needleman et al. (2004) have suggested that OHRQoL-measures can detect changes in quality of life before and after periodontal therapy.

As it is known, periodontal diseases and the consequence of untreated periodontitis – tooth loss negatively affect the quality of life [19]. Tooth loss can be restored by means of tooth-supported and implant-supported dentures. The later can be fixed or removable partial dentures. Patient comfort, esthetic demands differ concerning the type of dentures. The type of dentures may influence OHRQoL. Removable dentures have frequently been associated with complaints due to inappropriate design and manufacture. More favorable objective results can be achieved with fixed dentures. The fastest and highest quality of life development was observed in case of patients treated with fixed partial dentures, while the least favorable outcome was found among patients treated with removable partial dentures [20].

Theoretically, OHRQoL is a function of various symptoms and experiences and represents the person's subjective perspective [21]. Health psychologists have recognized that psychological assets such as optimism and resilience correlate with an individual's quality of life, particularly how well she or he is able to cope with disease and poor health [22, 23]. Therefore based on the paradigmatic shift toward a patient-centered, bio-psychosocial approach to oral healthcare, OHRQoL has become central to dental research. Many instruments have been investigated and used for quality of life assessment. Below the mostly often used variants are mentioned.

In last 25 years several questionnaires have been developed for patients' quality of life assessment. Since 1994 due to Slade and Spencer it became possible to evaluate patients' quality of life after dental rehabilitation with Oral Health Impact Profile. All impacts in the OHIP are conceptualized as adverse outcomes, and therefore the instrument does not measure any positive aspects of oral health [24].Seven dimensions are captured by the OHIP-49: Functional Limitation (9 items, e.g., "Have you had trouble pronouncing any words because of problems with your teeth, mouth, dentures, or jaw?" "Have you had food catching in your teeth because of problems with your teeth, mouth, or dentures?"), Physical Pain (9 items, e.g., "Have you had painful aching in your mouth because of problems with your teeth, mouth, or dentures?" "Have you had sensitive teeth with hot or cold food or drinks because of problems with your teeth, mouth, or dentures?"), Psychological Discomfort (5 items, e.g., "Have you felt tense because of problems with your teeth, mouth, or dentures?" "Have you been worried by dental problems?"), Physical Disability (9 items, e.g., "Have you had to interrupt meals because of problems with your teeth, mouth, or dentures?" "Have you had to avoid eating some foods because of problems with your teeth, mouth, or dentures?"), Psychological Disability (6 items, e.g., "Have you found it difficult to relax because of problems with your teeth, mouth, or dentures?" "Have you been embarrassed because of problems with your teeth, mouth, or dentures?"), Social Disability (5 items, e.g., "Have you had difficulty doing your usual jobs because of problems with your teeth, mouth, or dentures?" "Have you avoided going out because of problems with your teeth, mouth, or dentures?"), and Handicap (6 items, e.g., "Have you felt that life in general was less satisfying because of problems with your teeth, mouth,

or dentures?"). Responses are made on a 5-point ranging from "never" (0) to "very often" (4) [24, 25].

General Oral Health Assessment Index Questionnaire (GOHAI) developed by Atchison and Dolan [26] has been widely used to assess oral health in clinical or epidemiological studies. Validated initially in the USA, this questionnaire is available in French [27]. The GOHAI assesses self-perceived oral health through 12 questions that explore the pain, discomfort, dysfunctions and the psychosocial impacts of dental diseases [28].

General Oral Health Assessment Index Questionnaire (GOHAI) developed by Atchison and Dolan [26] is also used to assess oral health in clinical or epidemiological studies. Validated initially in the USA, this was first used for elderly North-Americans. The GOHAI assesses self-perceived oral health through 12 questions that explore the pain and discomfort, dysfunctions and the psychosocial impacts of dental diseases [29]. Three dimensions are captured by GOHAI: physical dysfunction (e.g. How often did you have trouble biting or chewing any kinds of food, such as a firm meat or apples?), psychosocial dysfunction (e.g. How often did you limit contacts with people because of the condition of your teeth or dentures?) and pain/discomfort (e.g. How often were your teeth or gums sensitive to hot, cold or sweet foods?). The answers are categorized in 5-grades scale as 1(always), 2 (often), 3 (sometimes), 4 (seldom) and 5 (never).

Another questionnaire is OIDP – Oral Impacts on Daily Performances. This was presented in 1997 by Adulyanon and Sheiham [30, 31]. This instrument considers the self-perception of oral health conditions and its interference in daily activities in the past 6 months, based on the dimensions of pain and discomfort, functional limitations and dissatisfaction with appearance. OIDP includes 8 items: eating, speaking, cleaning teeth, sleeping and relaxing, showing teeth while smiling, emotional status, carrying out work, enjoy social contact [32]. The answers are differing from those of OHIP and GOHAI. Here the answer scale includes 0 (never affected), 1 (less than once a month), 2 (once or twice a month), 3 (once or twice a week), 4 (3-4 times a week) and 5 (every or nearly every day).

The most recently developed measure in common use today is the UK Oral Health Related Quality of Life measure (OHQoL-UK). The investigators are McGrath and Bedi, 2001. The OHQoL-UK was developed using open-ended, qualitative interviews with a large, randomly-selected sample of UK residents. It has 16 items. The OHQoL-UK attempts to assess both positive and negative impacts, asking whether oral status has a good effect, or a bad effect, or no effect on each of the 16 items. The lower overall score reflects poorer OHRQoL [33].

Oral-health quality of life inventory was developed by Cornell et al. in 1997. It has 56 items and measures such dimensions as nutrition, oral health and overall quality of life. Each answer has 2 parts: "A" includes answers "not at all" to "great deal"; "B" includes 4 categories from "unhappy" to "happy". This questionnaire is not so commonly used as above-mentioned variants [4].

Quality of life issues are now at the forefront of public health policy [34].

Assessment of oral health-related quality of life allows for a shift from traditional medical/dental criteria to assessment and care that focus on a person's social and emotional experience and physical functioning in defining appropriate treatment goals and outcomes [35]. Patients' subjective evaluation of the healthcare decision-making process is changing the dynamics of clinical practice and health outcomes monitoring and research [29]. Medical and dental research on health-related quality of life has flourished because of: (a) the patient's more active role as a member of the treatment team; (b) the need for evidence-based approaches in health practices; and (c) the fact that many treatments for chronic diseases fail to 'cure' the health condition, thereby elevating the importance of health-related quality of life as a valuable health outcome variable [36].

Patient-oriented outcomes like OHRQoL will enhance our understanding of the relationship between oral health and general health and demonstrate to clinical researchers and practitioners that improving the quality of a patient's well-being go beyond simply treating dental maladies [21].

The authors' choice of above mentioned instruments is different, depending on age of patients, mental abilities, article design, easiness of survey management, etc.

**Materials and Methods**

A literature search of MEDLINE (Pub-Med) and other Internet source (disserCat) through electronic and hand searching was performed via above-mentioned key-words being published from 1999 up to 2019. Both Mesh and Major terms were used in the search and Boolean operators (OR, AND) were used to combine the searches. Overall 677 articles were viewed. Including criteria were patients' age from 18 to 75, partial but not complete edentulousness and OHRQoL measuring with pretreatment and post-treatment changes. In included studies oral health-related quality of life was measured by validated questionnaires, such as OHIP (oral health impact profile), GOHAI (general oral health assessment index) and OIDP (oral impacts on daily performances) (Illustration 1).

Included studies were divided into two groups: assessment of OHRQoL after implant-supported prosthetic treatment and conventional tooth-supported prosthetic treatment (first group) and after non-surgical and surgical periodontal treatment (second group). In the first group studies about oral rehabilitation with complete dentures were not included, only fixed and partial removable dentures both implant and tooth-supported. The number of studies was 152. Then 23 studies were chosen with OHRQoL assessment after prosthetic treatment, among which only 5 studies fully were satisfactory for all inclusion criteria, as they investigate OHRQoL simultaneously in patients with tooth and implant supported prostheses.

Complex periodontal treatment includes periodontal non-surgical and surgical treatment. Studies involving

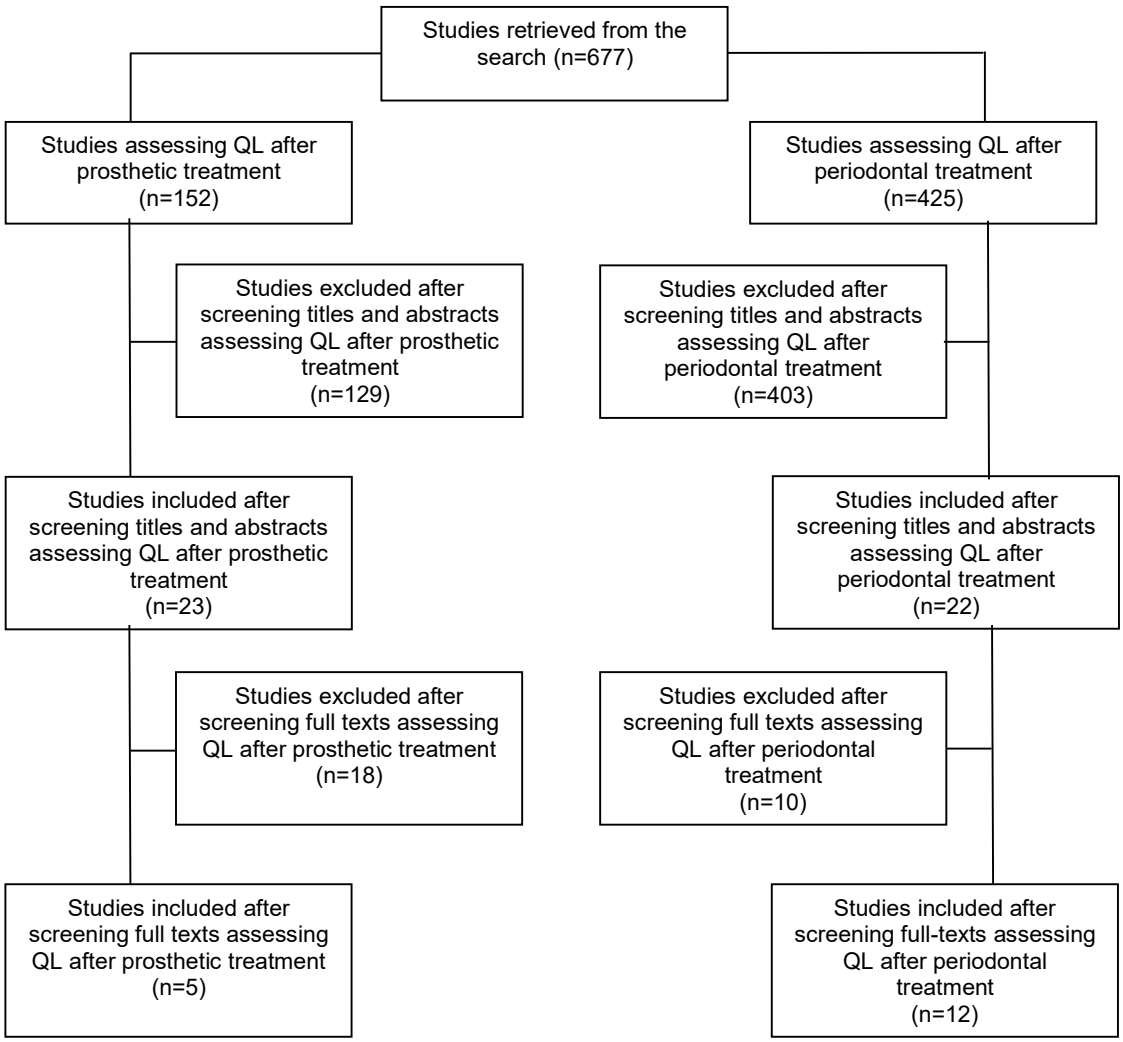
adult patients (>18 years) with periodontal disease receiving periodontal therapy (non-surgical and/or surgical) were eligible for inclusion in this review. Non-surgical therapy included any form of supra-/sub-gingival scaling and/or root planning. Surgical therapy included open flap debridement with or without the use of regenerative materials. The outcome of interest was a change in the patients' OHRQoL (or QoL) from baseline (pre-treatment) to a follow-up period from minimum 1 week to 12 months. 425 articles were reviewed, among which 12 studies were chosen, according to title, abstract form, study design, sample size, used validated questionnaire.

**Results**

**Quality of life of patients after prosthetic treatment**

Included 5 studies involve partially dentate patients and oral health-related quality of life was assessed after dental prosthetic treatments by means of implant-supported crowns (ISCs), implant-supported fixed dental prosthesis (IFDPs), implant-supported removable dental prosthesis (IRDPs), removable partial dentures (RPDs), and tooth-supported fixed dental prosthesis (TFDPs) (Table 2). 1 study was performed in Japan, 1 in US, 2 in Croatia and 1 in Russia. Fueki et al. (Japan, 2015) compares conventional removable dentures and implant-supported fixed dentures using OHIP-49. Number of patients with removable dentures at baseline, after 3-, 6- and 12-months follow-up periods were respectively 69, 52, 40 and 33, mean age – 63; number of patients with implant-supported fixed dentures at baseline, after 3-, 6- and 12-months follow-up periods were respectively 30, 12, 11 and 13, mean age – 56 [37]. Gates et al. (US, 2014) gives the comparison between conventional removable and implant-supported removable dentures. There were 17 patients in each group, mean age was 61 and oral health-related quality of life was measured using OHIP-49 [38]. A broad study was performed by Persic & Celebic (Croatia, 2015), where the authors investigate patients' quality of life after prosthetic rehabilitation with tooth-supported fixed denture (number of patients=25, mean age=52), implant-supported removable denture (number of patients=15, mean age=65) and implant-supported fixed denture (number of patients=59, mean age=56). But here short variant of OHIP-questionnaire – OHIP-14 was used [39]. Petrecievic et al. (Croatia, 2012) reported patients' quality of life assessment after prosthetic treatment with fixed dentures tooth and

Illustration **1. Flowchart concerning exclusion and inclusion of retrieved studies (n – number of studies, QL – quality of life).**



implant-supported (number of patients in tooth-supported group=38, mean age=57; number of patients in implant-supported group=64, mean age=47) [40]. In this study OHIP-49 was used. Swelem et al. (Russia, 2014) demonstrated patients' quality of life measurements after dental rehabilitation with tooth-supported fixed denture (number of patients=32, mean age=44), conventional removable denture (number of patients=45, mean age=44) and implant-supported fixed denture (number of patients=57, mean age=35). Here quality of life assessment was performed using OHIP-14 [41]. From 5 above-mentioned studies 4 were prospective clinical study [37, 39-41] and 1 was crossover controlled clinical trial [33]. Follow-up recalls also were different. In 1 study there were 3, 6 and 12 months of follow-up [37], 2 studies had 3 months of follow-up [38, 39], 1 study had 36 months of follow-up [40] and the last one – 1.5 and 6 months of follow-up [41]. All studies used representative samples of the partially dentate participants, reported clearly on the type of dental prosthesis used, and explained the outcome used and the scoring method. Variability was found in age, tooth position, and number of teeth being replaced.

TFDP – Tooth-supported Fixed Dental Prosthesis; RPD – Removable Partial Denture; IFDP – Implant-supported Fixed Dental Prosthesis; IRDP – Implant-supported Removable Dental Prosthesis

**Quality of life of patients after periodontal treatment**

From 425 articles 12 were chosen with 694 participants, who received periodontal treatment (non-surgical and surgical) and were underwent quality of life assessment with validated questionnaires. The age of participants varied from 20 to 75 years old.

Twelve studies were eligible for inclusion – eight prospective clinical studies [27, 42-48], one controlled before-after study [51] and three randomized clinical trials [13, 49, 50]. Four studies were performed in the UK, two each in Japan and Brazil and one each in Turkey, Hong Kong, Sweden and India (Table 3). Sample sizes of the included studies ranged from 32 to 183 (mean = 58.09). The follow-up period ranged from 1 week to 12 months. Only one study reported outcomes after 12 months [48], whereas the other studies reported short- to medium-term follow-ups (range = 1 week to 6 months, mean = 8 weeks). All the studies used different instruments for patients' quality of life assessment. OHIP-14 was used by 6 studies [24, 27, 42, 48, 50, 51], GOHAI – 2 studies [45, 46], OIDP – 2 studies [44, 45], OHQoL-UK – 2 studies [49, 43], OHQoL-inventory – 2 studies [46, 47]. 9 studies were about quality of life assessment after non-surgical periodontal treatment [13, 27, 42, 44-46, 48, 49, 51], 3 studies after surgical periodontal treatment [43, 47, 50].

Eight studies reported statistically significant improvements in OHRQoL after periodontal therapy [24, 43, 45-48]. Saito et al. 2010, 2011, Pereira et al. 2011, Wong et al. 2012, reported improved outcomes after routine non-surgical treatment (NST) alone [(oral hygiene instructions (OHI) + scaling, root planning (SRP)]. One study reported improvement in OHQoL of "moderate-risk" periodontitis patients after NST with local drug delivery [43]. Another study reported improved outcomes after 24-h root debridement with chlorhexidine irrigation [51]. Tsakos et al. reported an improvement after both routine NST and intensive NST (OHI + SRP+ local antibiotics). Five studies reported results of correlation analyses between OHRQoL and clinical parameters. Of these, three reported statistically significant correlations [44, 45, 47]. Poorer OHRQoL correlated with greater probing pocket depth ($p = 0.007$) [45] before treatment, and with higher percentage of sites with probing pocket depth of 4 mm ($p = 0.029$) [55] and fewer remaining teeth ($p = 0.008$) [45], ($p = 0.003$) [44] after treatment.

NST – non surgical treatment; ST – surgical treatment; SRP – scaling and root planning; OHI – oral hygiene instructions; OFD – open flap debridement

**Discussion**

Reviewed literature reveals different methods used for patients' quality of life assessment. Also follow-up periods were different – from 1 week to 36 months. Studies employed interviews and patient-completed questionnaires. Patients' quality of life assessment criteria in all used OHRQoL questionnaires mostly concerning physical dysfunction, psychosocial dysfunction and pain/discomfort. Decrease in score of OHRQoL after follow-up means increase in patients' quality of life level.

Within the limits of the available literature in the first group tooth-supported and implant-supported fixed dentures had positive effects on oral health-related quality of life. Implant-supported fixed dentures showed greater short-term improvement than tooth-supported fixed dentures. In the second group studies reported a statistically significant improvement in oral health-related quality of life after non-surgical treatment. Concerning periodontal treatment no significant differences were reported between different forms of non-surgical treatment. Surgical therapy had a relatively lower impact on quality of life of patients. A correlation between poor clinical response to therapy and poor oral health-related quality of life outcomes was observed. Oral health related quality of life was affected by clinically assessed periodontal diseases by measuring clinical attachment level and pocket probing depth. There was evidence for increased impairment with greater severity and extent of periodontal diseases, and the recognition of the association was increased when full mouth recording protocols were applied. Routine non-surgical therapy can moderately improve the OHRQoL in adults with periodontal disease [52]. In included studies no significant differences were reported between different forms of non-surgical periodontal therapy. Surgical therapy had a relatively lower impact on oral health-related quality of life.

Table 2. Characteristics of studies including patients' quality of life assessment after prosthetic treatment

| Study | Country | Study design | Participants | OHRQoL instrument | Follow- up period (month) | Prosthetic treatment |
|---|---|---|---|---|---|---|
| Petrecievic et al, 2012 | Croatia | Prospective Clinical Study | TFDP baseline sample (N=38), IFDP baseline sample (N=64) | OHIP-49 | 36 | TFDP<br>IFDP |
| Gates et al, 2014 | USA | Crosscover Controlled Clinical Trial | Baseline sample (N=17),<br>RPD follow-up (N=17),<br>IRPD follow-up (N=17) | OHIP-49 | 3 | RPD<br>IRDP |
| Swelem et al, 2014 | Russia | Prospective Clinical Study | TFDP sample (N=32), RDP sample (N=45),<br>IFDP sample (N=57) | OHIP-14 | 1.5<br>6 | TFDP<br>RPD<br>IFDP |
| Fueki et al, 2015 | Japan | Prospective Clinical Study | RPD baseline sample (N=69),<br>RPD 3-months follow-up (N=52),<br>RPD 6-months follow-up (N=40),<br>RPD 12-months follow-up (N=33);<br>IFDP baseline sample (N=30),<br>IFDP 3-months follow-up (N=12),<br>IFDP 6-months follow-up (N=11),<br>IFDP 12-months follow-up (N=13) | OHIP-49 | 3<br>6<br>12 | RPD<br>IFDP |
| Persic & Celebic, 2015 | Croatia | Prospective Clinical Study | TFDP sample (N=25), IRDP sample (N=15),<br>IFDP sample (N=59) | OHIP-14 | 3 | TFDP<br>IRDP<br>IFDP |

Table 3. Characteristics of studies including patients' quality of life assessment after periodontal treatment

| Study | Country | Study design | Participants | OHRQoL instrument | Follow- up period | Periodontal treatment |
|---|---|---|---|---|---|---|
| Bajwa et al. 2007 | UK | Prospective clinical study | 127 patients | OHIP-14 | 6 months | NST&OHI, Supra-& subgingival et al.SRP |
| Ozcelik | Turkey | Randomized Clinical Trial | 60 patients | OHIP-14<br>GOHAI | 1 week | I group – OHI&SRP<br>II group – OHI&OFD<br>III group – OHI, OFD&EMD |
| Aslund et al. 2008 | UK | Randomized Clinical Trial | 61 patients | OHQoL-UK | 8 weeks | NST(mechanical instrumentation)<br>NST (hand instrumentation) |
| Jowett et al. 2009 | UK | Prospective Controlled study | 36 patients | OHIP-14 | 1 week<br>3 months | OHI&SRP<br>OHI |
| Saito et al. 2010 | Japan | Prospective Case Studies | 58 patients | OHRQL-J | 3 weeks | NST (OHI&SRP) |
| Tsakos et al. 2010 | UK | Randomized Clinical Trial | 45 patients | OIDP | 1 month | OHI&SRP<br>OHI&Scaling |
| Saito et al. 2011 | Japan | Prospective Case Study | 42 patients | OHRQL-J | 3 months | NST (OHI&SRP)<br>ST (OFD) |
| Pereira et al. 2011 | Brazil | Prospective Case Study | 32 patients | OIDP | 45 days | NST (OHI&SRP) |
| Nagarajan et al. 2012 | India | Prospective Case Study | 191 patinets | OHQoL-UK | 6 months | NST (SRP)<br>ST (OFD) |
| Wong et al. 2012 | Hong Kong | Prospective Case Study | 65 patients | OHIP-14 | 12 months | NST (OHI&SRP) |
| Ohrn & Jönsson 2012 | Sweden | Prospective Case Study | 42 patients | OHIP-14<br>GOHAI | 2 weeks | NST (scaling & polishing) |
| Mendez et al. 2017 | Brazil | Prospective Case Study | 55 patients | OHIP-14 | 1 month<br>3 months | NST (supragingival scaling & SRP) |

## Conclusion

Patients with periodontal disease have poor quality of life, concerning pain, difficulties of mastication, speech, satisfaction, etc., which can be improved by qualified periodontal and prosthetic treatments to eliminate periodontitis and in most of cases to restore partial edentulousness. Studies show that quality of life improvement occurs after complex periodontal treatment and oral rehabilitation. While reviewing available literature including patients' quality of life assessment instruments, such as validated OHRQoL questionnaires, type of questionnaire and the mode of administration were different.

Thus, in US and in different countries of Europe and Asia different questionnaires are used assessing oral health-related quality of life. Still there is no unique questionnaire or method for life quality assessment of dental patients. This, of course, is influenced by cultural diversity, ethnic values and other factors. The further investigations are needed to create unique questionnaire for oral health-related quality of life measurement, which later can

be validated in different countries according to their ethnic and cultural advantages.

***Conflict of interest:*** *The authors declare that they have no conflict of interests.*

*References:*


1. Engel GL. The need for a new medical model: a challenge for biomedicine. Science. 1977;196:129–136.
2. Locker D. Measuring oral health: a conceptual framework. Community Dental Health. 1988;5:3–18.
3. Locker D, Allen PF. Developing short-form measures of oral health-related quality of life. Journal of Public Health Dentistry. 2002;62:13–20.
4. Shearer DM, MacLeod RJ, Thomson WM. Oral-health-related quality of life: an overview for the general dental practitioner. New Zealand Dental Journal. 2007;103:82–87.
5. Glick M, Meyer DM. Defining oral health: a prerequisite for any health policy. Journal of the American Dental Association. 2014;145:519–520.
6. Williams J (2015) CSA defines oral health through cross-organizational effort. American Dental Association News. [WWW document]. URL http://www.ada.org/en/publications/ada-news/2015-archive/january/csa-defines-oralhealth- through-cross-organizational-effort [accessed on 22 December 2015].
7. Eke PI, Dye BA, Wei L, Slade GD, Thornton-Evans GO, Borgnakke WS, Taylor GW, Page RC, Beck JD, Genco RJ. Update on Prevalence of Periodontitis in Adults in the United States: NHANES 2009-2012. J Periodontol. 2015;86:611–622.
8. Marcenes W, Kassebaum NJ, Bernabé E, Flaxman A, Naghavi M, Lopez A, Murray CJL. Global Burden of Oral Conditions in 1990-2010: A Systematic Analysis. J Dent Res. 2013;92(7):592–597.
9. Chapple IL, Genco R. Diabetes and periodontal diseases: consensus report of the Joint EFP/AAP Workshop on Periodontitis and Systemic Diseases. J Periodontol. 2013;84(4 Suppl):S106–12.
10. Linden GJ, Lyons A, Scannapieco FA. Periodontal systemic associations: review of the evidence. J Clin Periodontol 2013;14:S8–19.
11. Tonetti MS, Van Dyke TE. Periodontitis and atherosclerotic cardiovascular disease: consensus report of the Joint EFP/AAP Workshop on Periodontitis and Systemic Diseases. J Periodontol. 2013 Apr;84(4 Suppl):S24–9.
12. Hujoel P. Endpoints in periodontal trials:the need for evidence-based research approach. Periodontol. 2000. 2004;36:196–204.
13. Tsakos G, Bernabe E, Pikhart H, Tonetti M, Sheiham A, Donos N. Assessing the minimally important difference in the oral impact on daily performances index in patients treated for periodontitis. J Clin Periodontol. 2010;37:903–909.
14. Armitage GC. Manual periodontal probing in supportive periodontal treatment. Periodontology. 2000;12:33–39.
15. Renvert S, Persson GR. A systematic review on the use of residual probing depth, bleeding on probing and furcation status following initial periodontal therapy to predict further attachment and tooth loss. Journal of Clinical Periodontology. 2002;29(Suppl. 3), 82–89; discussion 90–81.
16. Savage A, Eaton KA, Moles DR & Needleman I. A systematic review of definitions of periodontitis and methods that have been used to identify this disease. Journal of Clinical Periodontology. 2009;36:458–467.
17. WHO (2003).The World Oral Health Report 2003:Continuous Improvement of Oral Health in the 21st Century – The Approach of the WHO Global Oral Health Programme. Geneva, Switzerland:World Health Organization.
18. John MT, Hujoel P, Miglioretti DL, LeResche L, Koepsell TD, Micheelis W. Dimensions of oral-health-related quality of life. Journal of Dental Research. 2004;83:956–960.
19. Gerritsen AE, Allen PF, Witter DJ, Bronkhorst EM, Creugers NH. Tooth loss and oral health-related quality of life: a systematic review and meta-analysis. Health and Quality of Life Outcomes. 2010;8:126.
20. John MT, Slade G, Szentpétery A, Setz JM. Oral health-related quality of life in patients treated with fixed, removable, and complete dentures 1 month and 6 to 12 months after treatment. Int J Prosthodont. 2004;17:503–11.
21. Sischo L, Broder HL. Oral health-related quality of life: what, why, how and future implications. J Dent Res. 2011; 90(11):1264–1270.
22. Broder HL. Using psychological assessment and therapeutic strategies to enhance well-being. Cleft Palate-Craniofac. 2001;38:248–254.
23. Lopez SJ, Snyder CR, Rasmussen NH. Striking a vital balance: developing a complementary focus on human weakness and strength through positive psychological assessment. In: Positive psychological assessment:a handbook of models and measures; 2003.
24. Slade GD, Spencer AJ. Development and evaluation of the Oral Health Impact Profile. Community Dent Health. 1994;11:3–11.
25. Anagnostopoulos F. Oral helath impact profile. In: Michalos AC. (ed.) Encyclopedia of Quality of Life and Well-Being Research. Srpinger Reference Publishing; 2014. p. 4506–4510.
26. Atchison KA, Dolan TA. Development of the Geriatric Oral Health Assessment Index. J Dent Educ. 1990;54:680–7.
27. Bajwa A, Watts TL, Newton JT. Health control beliefs and quality of life considerations before and during periodontal treatment. Oral Health and Preventive Dentistry. 2007;5:101–104.
28. Batista MJ, Lawrence HP, and de Sousa ML. Impact of tooth loss related to number and position on oral health quality of life among adults. Health Qual Life Outcomes. 2014;12:165.
29. Inglehart MR, Bagramian RA. Oral health-related quality of life: an introduction. In: Oral health-related quality of life. Chicago: Quintessence Publishing Co. Inc.; 2002. p.1-6.
30. Adulyanon S, Sheiham A. Oral impacts on daily performances. In: Slade GD (ed). Measuring Oral Health and Quality of Life. Chapel Hill: University of North Carolina, 1997:151–160.
31. Adulyanon S, Vourapukjaru J, and Sheiham A. Oral impacts affecting daily performance in a low dental disease Thai population. Community Dent Oral Epidemiol. 1996;24:385–389.
32. Johnston BC, Patrick DL, Thorlund K, Busse JW, da Costa BR, Schunemann HJ et al. Patient-reported outcomes in meta-analyses-part 2: methods for improving interpretability for decision-makers. Health Qual Life Outcomes. 2013;11:211.
33. McGrath C, Bedi R. An evaluation of a new measure of oral health related quality of life - OHQoL-UK. Community Dental Health. 2001;18:138–143.
34. Slade GD. Assessment of oral health-related quality of life. In:Oral health-related quality of life. Inglehart MR, Bagramian RA, editors. Carol Stream, IL: Quintessence Publishing Co., Inc.; 2002. p. 29–46.
35. Christie M, French D, Sowden A, West A. Development of child centered, disease-specific questionnaires for living with asthma. Psychosom Med. 1993;55:541–548.
36. Najman JM, Levine S. Evaluating the impact of medical care and technologies on the quality of life: a review and critique. Soc Sci Med. 1981;15F(2-3):107–15.
37. Fueki K, Igarashi Y, Maeda Y, Baba K, Koyano K, Sasaki K. et al. Effect of prosthetic restoration on oral health-related quality of life in patients with shortened dental arches: a multicentre study. J Oral Rehabil. 2015;42:701–708.
38. Gates WD. 3rd, Cooper LF, Sanders AE, Reside GJ, and De Kok IJ. The effect of implant-supported removable partial dentures on oral health quality of life. Clin Oral Implants Res. 2014;25:207–213.
39. Persic S, Celebic A. Influence of different prosthodontic rehabilitation options on oral health-related quality of life, orofacial esthetics and chewing function based on patient-reported outcomes. Qual Life Res. 2015;24:919–926.
40. Petricevic N, Celebic A, Rener-Sitar KA. 3-year longitudinal study of quality-of-life outcomes of elderly patients with implant- and tooth-supported fixed partial dentures in posterior dental regions.

Gerodontology. 2012;29:e956–e963.
41. Swelem AA, Gurevich KG, Fabrikant EG, Hassan MH, Aqou S. Oral health-related quality of life in partially edentulous patients treated with removable, fixed, fixed-removable, and implant-supported prostheses. Int J Prosthodont. 2014;27:338–347.
42. Mendez M, Melchiors A, Stadler AF, Oppermann RV, Gomes S. Impacts of supragingival and subgingival periodontal treatments on oral health-related quality of life. Int J Dent Hyg. 2017;15(2):135–141.
43. Nagarajan S, Chandra RV. Perception of oral health related quality of life (OHQoL-UK) among periodontal risk patients before and after periodontal therapy. Community Dental Health. 2012;29:90–94.
44. Ohrn K, Jönsson B. A comparison of two questionnaires measuring oral health-related quality of life before and after dental hygiene treatment in patients with periodontal disease. International Journal of Dental Hygiene. 2012;10:9–14.
45. Pereira LJ, Gazolla CM, Magalha˜ es IB, Ramos-Jorge ML, Marques LS, Gameiro GH, Fonseca DC, Castelo PM. Treatment of chronic periodontitis and its impact on mastication. Journal of Periodontology. 2011;82:243–250.
46. Saito A, Hosaka Y, Kikuchi M, Akamatsu M, Fukaya C, Matsumoto S, Ueshima F, Hayakawa H, Fujinami K, Nakagawa T. Effect of initial periodontal therapy on oral health-related quality of life in patients with periodontitis in Japan. Journal of Periodontology. 2010;81:1001–1009.
47. Saito A, Ota K, Hosaka Y, Akamatsu M, Hayakawa H, Fukaya C, Ida A, Fujinami K, Sugito H, Nakagawa T. Potential impact of surgical periodontal therapy on oral health-related quality of life in patients with periodontitis: a pilot study. Journal of Clinical Periodontology. 2011;38:1115–1121.
48. Wong RM, Ng SK, Corbet EF, Keung Leung W. Non-surgical periodontal therapy improves oral health-related quality of life. Journal of Clinical Periodontology. 2012;39:53–61.
49. Aslund M, Suvan J, Moles DR, D'Aiuto F & Tonetti MS. Effects of two different methods of non-surgical periodontal therapy on patient perception of pain and quality of life: a randomized controlled clinical trial. Journal of Periodontology. 2008;79(6):1031–1040.
50. Ozcelik O, Haytac MC, Seydaoglu G. Immediate post-operative effects of different periodontal treatment modalities on oral healthrelated quality of life: a randomized clinical trial. Journal of Clinical Periodontology. 2007;34:788–796.
51. Jowett AK, Orr MT, Rawlinson A, Robinson PG. Psychosocial impact of periodontal disease and its treatment with 24-h root surface debridement. Journal of Clinical Periodontology. 2009;36:413–418.
52. Shanbhag S, Dahiya M, Croucher R. The impact of periodontal therapy on oral health-related quality of life in adults: a systematic review. J Clin Periodontol. 2012;39:725–735.