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Quality of life in patients with temporomandibular disorders. A systematic review

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SUMMARY

Objective. The purpose of this study was to systematically review the literature concerning the quality of life of patients with temporomandibular joint disorder.

Material and methods. Systematic review was performed with the information contained in international databases: PubMed and Google Scholar. Keywords and their combinations were used to find relevant articles and publications concerning the subject.

Results. A total of 320 publications were initially retrieved. After further examination 12 articles were selected due to their relevance to inclusion criteria and were included in the systematic review. The selected 12 articles published between year 2006 and 2016.

Conclusion. In this systematic review it was found that there is a direct correlation between temporomandibular disorders and lower quality of life. Out of questionnaires used for identification of patient satisfaction SF-36 and OHIP-14 were most popular in these studies. Statistical analysis of studies mentioned lead us to believe that psychological and physical ailments caused by TMD result in lower quality of life in patients.

Key words: quality of life, temporomandibular joint disorders, temporomandibular dysfunction.

INTRODUCTION

Temporomandibular disorder (TMD) is a general term given for an illness involving a series of clinical signs and symptoms concerning masticatory muscles, temporomandibular joints (TMJ) and associated structures (1).

Most common TMD signs and symptoms are chronic pain, jaw muscle soreness, limited range of jaw movement and temporomandibular joint noises (2). Majority of pain reported by patients is located in masticatory muscles and/or pre-auricular region, this can be easily exacerbated by chewing or other jaw activity (1). Other symptoms include, but are not limited to joint noises, jaw movement asymmetry, commonly described as clicking, popping, grating, or crepitus (3-5), painless masticatory muscles hypertrophy, muscle fatigue (1), also a wide variety of symptoms including headache, bruxism, tenderness upon palpation and difficulty opening the mouth due to limited range of movement (3, 4). Our selected studies show that the main cause of non-dental pain in the orofacial region are musculoskeletal conditions related to cervical regions, as well as masticatory musculature, while longitudinal studies have shown that the progression of pain severity is uncommon (6).

Temporomandibular disorders can have a wide variety of causes, among which, most common are: parafunctional habits, occlusal disharmony, stress, anxiety, trauma and microtrauma, mandibular instability, postural imbalance and abnormal physiological conditions (7). Several factors including sleep disorders as well as physical, emotional, and occlusal stress may inhibit the adaptive capacity of the stomatognathic system and make the occurrence of the disorder more likely (8).

Clinical studies agree that chronic medical conditions have strong negative effects on patients quality of life (9, 10).

Main objective of this review was to find a relation between temporomandibular disorder and a decrease in patients quality of life.

Goals of our systematic review:

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Review clinical trials of patients with TMD on international databases to find out about their quality of life.

Find out what methods should be used to determine quality of life of patients with temporomandibular disorder.

Determine why TMD is causing patients to have a lower quality of life.

MATERIAL AND METHODS

A systematic review was conducted which relied on information contained in international databases: National Library of Medicine – Medline/PubMed and Google Scholar.The review was conducted in accordance with PRISMA Statement guidelines. The articles used for this review were found and selected on 6th of February, 2016. The search was conducted with the goal to find clinical trials concerning the relationship between quality of life and temporomandibular disorders. The keywords and their combinations used in our search were: Quality of life, Temporomandibular joint disorders, Temporomandibular dysfunction. A total of two independent investigators performed the aforementioned searches and study selection. The appropriateness of the studies was evaluated by reading and reviewing the articles. The following selection criteria were applied: full text articles, only clinical trials, articles in English, adult patients, selected publications contains information for the tasks specified criteria. Systematic literature reviews and publications considering quality of life as a treatment outcome (related to intervention) are not included in this systematic review.

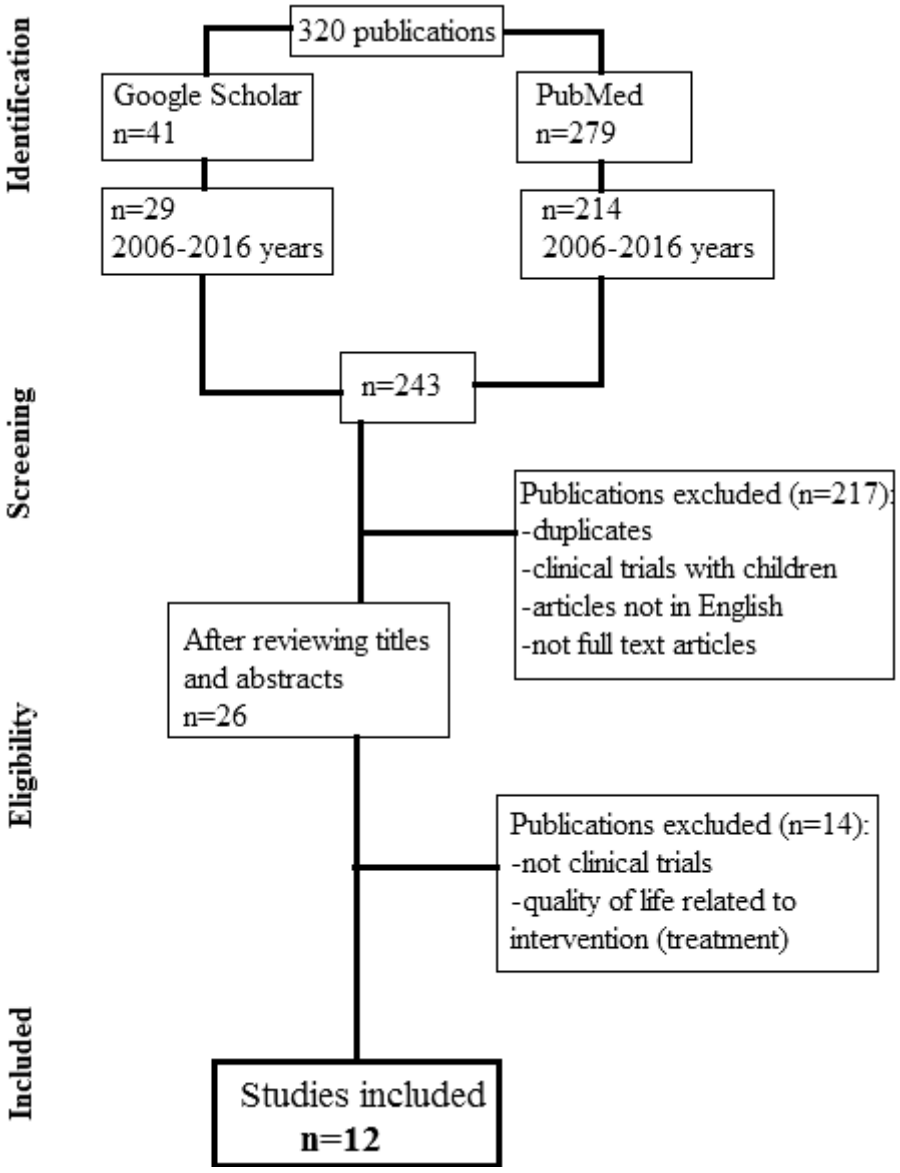

Fig. Search strategy flow chart

A total of 320 publications were initially retrieved. Out of total 320 articles, 41 were found by using Google Scholar and 279 by using PubMed search. Firstly, after initial retrieval, all articles that were older than 10 years were removed, leaving 243 that were suitably up to date. Secondly, article duplicates and incomplete publications were eliminated. The next step of screening involved titles and abstract reviewing. At this stage, the following exclusion criteria were used: duplicates, clinical trials with children, articles not in English, not full text articles. This eliminated most of the articles retrieved from PubMed due to their titles and contents, leaving 26 articles (7 articles from Google Scholar database and 19 articles from PubMed database). Out of 26 remaining studies, 12 were in full accordance with provided inclusion criteria and were included in the systematic review, the 14 that were excluded were either not clinical trials or were related to quality of life after treatment. Due to previous removal of articles older than 10 years our selected publications were published from 2006 to 2016. A total of 12 clinical trials are presented and discussed in the review. Search strategy is illustrated on the flow-chart (Figure).

RESULTS

Relation between quality of life and temporomandibular disorders

The 12 clinical trials that were included in this review, assessed the quality of life of patients with temporomandibular disorders. Three of the selected studies have found that there is a direct relation between temporomandibular disorders and a degradation of patients quality of life (2, 11, 12), however two of the reviewed studies concluded that temporomandibular disorders do not affect the quality of life (13, 14). Another three studies found that patients with this particular pathology have lower quality of life than their control group (4, 15, 16). Finally five studies concluded that more severe cases of TMD disorder, cause lower quality of life (1-3, 7, 17). One of the studies selected pointed out that patients with arthralgia, osteoarthritis or osteoarthrosis have lower quality of life than patients with myofascial pain or disc displacement (3). A brief summary of selected study descriptive characteristics can be found below (Table).

Table. Summary of the study descriptive characteristics of included studies

Research	Quality of life assessment method	Number of patients, gender (average age)	Number of patients in the control group, gender (average age)	Results
Moreno, B. G. D. *et al.* 2009 (15)	SF-36	27 female (30.1±5.8)	18 female (23.4±2.3)	Patients' with TMD quality of life is lower than control group.
Tjakkes, G. H. E. *et al.* 2010 (3)	SF-36 HADS	95 patients, 90 female and 5 male (40.3±13.1)	–	The more severe TMD is, the lower quality of life
Kim, T. Y. *et al.* 2015 (4)	EQ-5D	17, 198 patients (≥19)	–	Patients' with TMD quality of life is lower due to sociodemographic and general health problems
Roberto, D. *et al.* 2009 (16)	SF-36	146 patients, 30 male and 116 female (35, 2 ±14, 38)	–	Patients' with TMD quality of life is lower in all aspects related to pain and depression.
Pereira, T. C. *et al.* 2010 (17)	OHIP-14 QVV	33 female (25.61)	–	The more severe TMD is, the lower quality of life
Gui, M. S. *et al.* 2014 (13)	SF-36	37 female with localized pain (24.92±5.0) and 39 female with widespread pain (53.21±9.34)	40 female (50.93±12.34)	Temporomandibular disorders do not affect the quality of life. Patients' with TMD quality of life in all aspects was the same as in control group.
Rovida, T. A. S. *et al.* 2015 (14)	WHO	39 patients, 2 male and 37 female (38, 7)	–	Temporomandibular disorders do not affect the quality of life, there is no relation between temporomandibular disorders and quality of life
Lemos, G. A. *et al.* 2015 (1)	OHIP-14	135 patients, 58 male and 77 female (18-25)	–	The more severe TMD is, the lower quality of life
Resende, C. M. B. M. d. *et al.* 2013 (11)	WHO	60 patients, 53 female and 7 male (36, 48)	–	There is a relation between temporomandibular disorders and quality of life
Oliveira, L. K. d. *et al.* 2015 (7)	SF-36	119 female	41 female	The more severe TMD is, the lower quality of life
Blanco-Aguilera, A. *Et al.* 2014 (12)	OHIP-14	407 patients, 365 female (42.15 ± 14.63) and 42 male (41.48 ± 17.28)	–	There is a relation between temporomandibular disorders and quality of life
Miettinen, O. 2012 (2)	OHIP-14	149 patients, 79 TMD patients including 18 male and 61 female (43.5±13.1), 70 not TMD patients including 23 male and 47 female (25.3±6.5)	–	There is a relation between temporomandibular disorders and quality of life. The more severe TMD is, the lower quality of life

Methods for assessment of quality of life

The following questionnaires were used to assess mental and physical wellbeing of patients with TMD disorder: SF-36 (3, 7, 13, 15, 16), HADS (3), EQ-5D (4), OHIP-14 (1, 2, 12, 17), QVV (17), WHO (11, 14).

SF-36 – Short Form 36 Medical Outcomes Study questionnaire (used in studies (3, 7, 13, 15, 16)). This self-administrated, general purpose questionnaire is composed of 36 questions related to patients health (16). It is not targeted towards any specific age group, disease or treatment group. The patient has to rate their wellbeing in 8 scales: physical function (10 items), role-physical (4 items), bodily pain (2 items), general health status (5 items), vitality (4 items), social function (2 items), role-emotional (3 items), mental health (5 items) and 1 question comparing evaluation between the current health and their wellbeing the previous year, on a scale from 0 to 100 (higher score meaning better quality of life) (15). Poor average score in any of the 8 scales can be taken as an indication of problems or compromised quality of life (16).

HADS – the Hospital Anxiety and Depression Schedule (3) – this questionnaire is used to evaluate anxiety and depression. It consists of 14 questions, of which odd numbers are used to screen for anxiety (HADS-A) and even numbers for the screening of depression (HADS-D). The patient rates himself on a scale of 0 to 3 on each of the questions. A total score of up to 7 out of 21 in any subscale, indicate a normal quality of life, while 8 and higher may indicate an onset of anxiety or depression (3).

EQ-5D - EuroQol-5 Dimension (4) – composed of 5 segments regarding current health state: mobility (M), self care (SC), usual activities (UA), pain/discomfort (PD), and anxiety/depression (AD). The EQ-5D evaluation questionnaire is only used to assess quality of life. Patient functionality is rated in 3 grades (1 no problem; 2 some/moderate problem; and 3 extreme problem) (4).

OHIP-14 – OHIP-short form questionnaire (1, 2, 12, 17) - questionnaire consists of 14 questions aimed at measuring of patients‘ perception of the impact their oral conditions have on their quality of life. The patient has to rate their wellbeing on a 5-point scale (never – 0, almost never – 1, sometimes – 2, almost always – 3 and always – 4). Final score is obtained by summing obtained values of all 14 questions (17). OHIP-14 consists of 7 segments detailing patients‘ oral health impact on their quality of life: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap. These segments are based on conceptual model of oral health (2).

QVV – V-RQOL protocol (17) – it is a voice-related quality of life protocol. The purpose of this protocol is to understand how a speech impediment can affect person’s daily activities. It displays a list of possible voice-related issues, to which the individuals has to respond on a 5-point scale, depending on how their voice was affected during the last two weeks (1 – excellent, 2 – very good, 3 – good, 4 – reasonable and 5 – bad). Out of 10 questions in this protocol, 6 of them are for the physical and functional domain and 4 are meant to evaluate patients‘ socio-emotional domain. The full score ranges from 0 (zero) to 100. The higher the value, the lower the quality of life is (17).

WHO – The WHOQOL-BREF – The World Health Organization Quality of Life questionnaire (11, 14) - the questionnaire consists of 2 general questions about the participant’s perception of their quality of life and their health and other 24 questions relating to 4 domains: physical, psychological, social relationships and environment. The patient has to choose out of three available answers, each one rated with a score, depending on the question. After all questions have been answered, the result is summed and converted into scale of 0 to 100. The default scale rating system for severity of the disorder is as follows: without TMD (0 to 15 points), mild TMD (20 to 45 points), moderate TMD (50 to 65) and severe TMD (70-100 points). The scores show a profile of the quality of life of the participants. Higher scores directly correlate to lower quality of life and general patient health (14).

Reasons which determine lower quality of life

The most common symptoms observed in patients with temporomandibular disorders were: chronic pain (3, 4, 7, 12, 15-17); loss of energy (3, 7, 15, 16); activity restriction (inability) of physical ailments and emotional disorders (3, 4, 7, 15-17); emotional state (3, 7, 15-17); general health problems (3, 7, 15, 16); anxiety/depression (2-4, 7, 15-17); taste changes (12, 18), discomfort when eating (12); voice changes (17), absence from work due to chronic pain (19).

The reviewed studies show that 78.13% of patients reported feeling tired or having a sore jaw upon waking in the morning. This leads to a conclusion that poor quality of sleep in TMD patients is important problem because physical and mental health is related to effective sleep which contributes to a good quality of life (19). Some studies noted that

difficulty falling asleep, waking up at dawn and restless or disturbed sleep affected TMD patients (7, 19). 90.62% of the patients complained about squeaks or involuntary clenching of the teeth during sleep. Poor quality of sleep caused by stress and chronic pain leads to impediment in daily, social and family activities, which may result in worse psychological status. This both inhibits their ability to work and minimizes desire to enjoy their free time (19).

DISCUSSION

Last few years have seen increasing growth of interest in oral-health related quality of life. Oral ailments can have consequences that affect various aspects of patients‘ mental and physical wellbeing and impair their quality of life (20). The most common TMD symptom, chronic pain, often leads to various forms of psychological distress like anxiety, stress or depression, social impairment, reduced working capacity, social costs, physical disability, reduced economical income which is caused by extensive need of medical services(21). In worst cases this can lead to unbearable pain or total incapacitation (22). Therefore, it is accepted that quality of life is negatively affected by chronic pain (3). Excluding physical abnormalities of jaw muscles or teeth and joints, emotional stress may also lead most patients to require psychological assistance (22). A large percentage of patients with TMD have reported to have difficulty falling or staying asleep (15). Sleep disruption due to pain is most commonly accented and can lead to sleep apnea and insomnia (19). Furthermore, pain and stress associated with TMD represent a negative influence on systemic health and quality of life, which compromise daily social activities at school or work, social functions, affective and cognitive equilibrium, sleep and physical activities (11).

Although TMD has been mostly observed in adults, epidemiological studies have reported signs and symptoms of temporomandibular disorders in adolescents as well as children (23). The literature review conducted did not cater to either gender, but it should be noted that the number of female clinical trials was higher. To add to that epidemiological studies clearly state that TMD symptoms are more commonly observed in women than men (24, 25). This may have been caused by more female patients with TMD, compared to male, looking for treatment for their pain problems (26). In reviewing gender differences in relation to quality of life, male patients appeared to be more affected by TMD than female (4). On the other hand, some studies show a lower quality of life in women when compared to men with TMD (12, 27).

Out of 12 clinical trials reviewed, 10 (1-4, 7, 11, 12, 15-17) have found a direct relation between worse temporomandibular disorder cases and lower quality of life and general patient health and only 2 (13, 14) did not. This leads to a conclusion that temporomandibular disorder is directly correlated with worse quality of life. Most commonly used methods of assessment were questionnaires SF-36(used in 5 of the clinical trials) and OHIP-14 (used in 4 of the clinical trials).

In summary, it can be reliably concluded that TMD negatively impacts patients quality of life, this is supported by 83.33% of the reviewed clinical trials. Two trials that did not agree with this conclusion (13, 14), had particularly small sample size compared to other clinical trials, this might have been the cause of their different findings. A limitation of this systematic review could have been caused by large female predominance in clinical trials which may have hampered the generalizability of the results.

Only one systematic review about TMD patiens quality of life was found in international databases. So the results of this systematic review were compared to a review about temporomandibular disorders and oral health related quality of life, performed by Dahlström, L. and Carlsson, G. E. in 2010. Clinical trials included in their systematic review were performed between years 1989 and 2009. None of the clinical trials used in 2010 systematic review were used this review. The systematic review performed by Dahlström, L. and Carlsson, G. E. showed that a substantial part of patients with TMD had their quality of life impacted by the disorder. Only about less than 5% of TMD patients experienced no significant impact to their quality of life. In the clinical trials used by this review, most common assessment method used was OHIP-14 questionnaire, it was used in 7 out of 12 reviewed studies. However the review found that gender differences were insignificant and statistically irrelevant in relation to TMD and lower quality of life (20). To summarize, both systematic reviews found direct correlation between lower quality of life and temporomandibular disorder and even after 6 years TMD remains a big problem due to its large influence on patients’ quality of life.

However, in the future, further studies for assessing other factors that impact quality of life (other diseases, social, demographic, psychological factors) are needed to establish and validate the relationship between low quality of life and temporomandibular disorders.

CONCLUSIONS

This systematic review shows, that there is a direct correlation between worse cases or temporomadibular disorder and lower quality of life. Most commonly used methods for quality of life assessment of patients with temporomandibular disorder were: SF-36 and OHIP-14. All questionnaires are equally good in evaluating this topic, but SF-36 and OHIP-14 are short form questionnaires, which are therefore very comfortable to use in everyday practice. It can be concluded that psychological and physical ailments discussed lead to lower quality of life in patients with temporomandibular disorders.

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