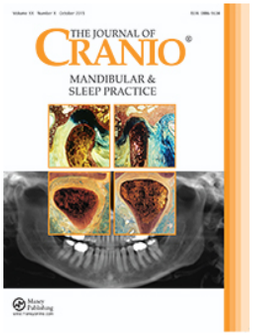

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Osteovox self-management concept study. Part 2: focus on the therapy

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ABSTRACT

Objective: To evaluate the effect of a self-management program on a population with both painful temporomandibular disorder (TMD) and parafunctional behaviors.

Methods: One hundred-seven participants enrolled in a program called Osteovox Self-Management Concept (OSMC). The primary outcome measure was the overall relief (OR) based on four pain and three functional limitation parameters. The secondary outcome measures concerned parafunctional behaviors, compliance with treatment, and several psychological and otological symptoms.

Results: The mean OR was 47% (standard deviation (SD): 28%) after 1 month, 72% (SD: 26%) after 3 months, and 77% (SD: 23%) after 6 months. Significant OR (i.e., 60%–100%) was observed in 80.11% of the patients. OR was strongly correlated with compliance. The OSMC efficiently reduced parafunctional behaviors and otological symptoms.

Discussion: This study demonstrated that OSMC is an effective, simple, short, and inexpensive therapy. This type of treatment follows the international recommendations of using reversible treatment for TMD.

KEYWORDS

Temporomandibular disorders (TMD); bruxism; parafunctional behaviors; psychology; self-management; compliance; otological symptoms; sensorimotor; therapeutic

Introduction

The probabilities and risk factors involved in developing a painful temporomandibular disorder (TMD) are multiple and are often a combination of psychological, neurophysiological, structural, and genetic factors [1,2]. Therapies, both reversible and irreversible, have been proposed to manage TMD. A 1996 consensus, reaffirmed in 2010 by the American Association for Dental Research (AADR), was put forward to give priority to the use of reversible methods [3].

Piron, an osteopath, and Dieudonné, a dentist specialized in TMD, have proposed a protocol, the Osteovox Self-Management Concept (OSMC), which meets the following criteria: alleviates complaints related to TMD, improves the behavioral disorders of the masticatory system, and achieves a simple and brief support, the purpose of which is to have a therapy that is sustainable, low-cost, patient-involving, and without contraindications or iatrogenic effects. The OSMC is a tool that can be used by the patient and is not time-consuming. In its protocol, the OSMC involves manual therapy, sensory-motor awakening (SMA), normalization of neuromuscular and biomechanical dysfunctions of the masticatory, lingual, and labial systems, and facilitates the learning of self-normalizations. The OSMC is part of a self-management (SM) philosophy. Only a few studies involving scientific data on SM therapies are actually available: indeed, only two systematic reviews (SR), the first one from 2013 (7 studies) [4] and the second one from 2016 (15 studies) [5], deal with the subject. These two SRs enhance encouraging results but also point out that further trials are required to conclude that SM programs are more effective than no treatment at all and/or placebo. Based on these scientific data, the idea of a multicentric clinical study was born. The authors drew a few hypotheses, which the study would answer. The hypotheses were the following:

- The OSMC is an efficient treatment that can significantly contribute to the patients' overall relief (OR).
- The OR is linked to the reduction of parafunctional behaviors.
- A relationship between OR and compliance does exist.

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Supplemental data for this article can be accessed here.

- There is also a correlation between compliance and the patient's psychological state.
- The OSMC can improve the otological symptoms.

On the semantic level, as previously described (refer to Part 1 of the study), the terms "parafunction" or "parafunctional behaviors" are used instead of "bruxism." Indeed, most patients suffering from bruxism experience an excessive tension in the lips or in the tongue, regardless of its place in the mouth.

The first article addressed the initial part of the study, which was the observational aspect of the population through the data collected during the prior evaluation (PE). At this stage, the epidemiological and clinical data of the participants were processed. This second part of the study concerns the therapeutic aspect. It focuses on the main objective of the study, which is the evaluation of OSMC results on a population of patients with parafunctional behaviors suffering from painful TMD.

Materials and methods

The study was multicentered and multidisciplinary. It was carried out in private offices in Liège, Belgium, Nantes, France, and Brescia and Torino, Italy by eight practitioners: two dentists (SLh, AB), four osteopaths (AP, XT, CG, MS), and two speech therapists (also called logopedists) (SLi, BP). The data covered in this article only relate to the therapeutic phase that took place between January 12 2016, and July 28 2017 (18 months). The full protocol can be accessed at http://www.osteovox.org. It was registered on ClinicalTrials.gov prior to the beginning of the study (December 17 2015, under the number B707201525923). The study had no source of funding.

Participants

The methodology for the selection process of the study population was developed in the first article. After this selection process, 107 adults with both painful TMD and parafunctional behaviors were included in the therapeutic stage of the study. The premature exits (PEx) were also analyzed after the study began. Five reasons could explain a PEx: reorientation (insufficient results), unknown causes (e.g. missing data), life events, health problems, and being satisfied with the level of treatment already received.

Conduct of the clinical phase

The clinical study was conducted at three time points during five visits (V0, V1, V2, V3, and V4):

(1) Diagnosis and inclusion (+ prior evaluation (PE)), in V0
(2) Therapeutic sessions (+ intermediate evaluation (IE)), in V1/V2/V3
(3) Closing session (+ final evaluation (FE)) in V4.

Whether the sessions were organized in solo (osteopaths alone (AP; CG; MS) and dentist alone (AB)) or in duo (dentist (SLh) and osteopaths (AP; XT) or speech therapists (BP; SLi)), V0 and V1 were different:

- In solo: V0 and V1 were done in the same session (which lasted 1 h 30 min)
- In duo: V0 (45 min) and V1 (45 min) were done in two different sessions.

The organization of (1) Diagnosis and inclusion (V0) was the subject of the first article. (2) The three therapeutic sessions (V1/V2/V3) lasted from up to 45 minutes to 1 hour each. One month separated V1 from V2. Two months separated V2 from V3. (3) The closing session (V4) took place six months after V1 either at the office or by mail or by phone.

Treatment studied

The overall relief (OR) experienced by the patients who benefitted from the OSMC treatment [6–10] performed by practitioners in two (V1 and V2) or three (V1, V2, and V3) sessions was evaluated. As the OSMC is a part of the SM behavioral treatments [5], the authors referred to the Behavioral Change Technique (BCT) taxonomy [11] to describe their treatment. Indeed, a recent international research program addressed the difficulties with defining BCT in studies, which are the core basic active ingredients of an intervention, through the creation of a BCT taxonomy involving 93 clearly-defined BCTs grouped into 16 clusters. The underlying hypothesis of creating the BCT taxonomy was that if studies could clearly define and specify the active ingredients of a behavioral change intervention used, this should lead to an improved understanding of the intervention, allowing for replications, and thereby, enabling further testing and intervention development efforts. The protocol is available at http://www.osteovox.org (useful links) and in the supplemental appendix 1 (Tables 1–3). The item sets of the OSMC are listed in 12 points of the BCT taxonomy (1,3,4,5,6,7,8,10,12,13,15,16). Before starting the clinical phase of the study, all the participants met over a period of two days in Liège (13 and October 14 2015) to standardize the modus operandi.

Evaluation criteria

Primary outcome measure

The patient's OR was evaluated by a mathematical formula. From among the parameters weighted by the patients when assessing their overall complaint, this formula incorporated the "pain" and "functional limitation" parameters through a visual analog scale (VAS). There were 11 possibilities: Pain 100%/Limitation 0% or Pain 90%/Limitation 10% or Pain 80%/Limitation 20% etc. Both formula and VAS are available in the supplemental appendix 2. The formula took into account (1) the changes in pain according to four parameters: frequency, intensity, quality of life, and medication being used; and (2) the changes in functional limitation evaluated from V0 to V4.

The questionnaires used to evaluate these parameters were described in the first article relating to the study but are nevertheless briefly described below:

(1) Pain/intensity: the Graded Chronic Pain Scale (GCPS v 2.0) [12,13]: average of the scores of items 2, 3, and 4.
(2) Pain/frequency: a scale from 0 to 30 days over the last month of treatment (2015 questionnaire created by L'homme S, unreferenced).
(3) Pain/quality of life: the GCPS v 2.0: average of the scores of items 6, 7 and 8.
(4) Pain/medication: the amount of analgesic, consumed per week, chosen by the patient as the most suitable way to manage his or her pain. Medication was not scored per se. It was scored through the ratio between the amount of analgesic consumed after treatment and the amount of analgesic consumed before treatment (a 2015 questionnaire created by L'homme S, unreferenced).
(5) Functional Limitation: the Jaw Functional Limitation Scale (JFLS 20) [14].

Secondary outcome measures

The change in the patient's parafunctions was evaluated via a shortened version (10 items: 1, 3–11) of the questionnaire, Oral Behaviors Checklist (OBC) [15] from V0 to V4.

To address potential sources of bias in the analysis of the results, patient compliance with the treatment at V2, V3, and V4 was estimated using a VAS developed by the authors (a 2015 questionnaire created by L'homme S et al., unreferenced, refer to supplemental appendix 3 and 4).

The therapists looked for the relationships that could exist between the following:

(1) The OR, the compliance, and the parafunctional behaviors.
(2) The patient's psychological condition, the parafunctional behaviors, and the compliance.

The change of otological symptoms was measured via a questionnaire developed by the authors (a 2015 questionnaire created by Piron A, unreferenced, see supplemental appendix 5).

The practitioners recorded subjective impressions related to the difficulty of the treatment, impact of the treatment in the long-term, and usefulness of the treatment in case of recurrence, thanks to a VAS developed by the authors (a 2015 questionnaire created by L'homme S et al., unreferenced, see supplemental appendix 6).

Statistical methods and sample's determination

The software used for the statistics was R (3.4.0 version) by the R Core Team (2017). R is a language and environment for statistical computing created by the R Foundation for Statistical Computing (Vienna, Austria). Microsoft Excel was used to format the data, calculate the main lens, and develop some graphics. The normality of the raw data was tested by the Shapiro test, in order to determine the type of statistical tests that could be used. The Kruskal-Wallis and Wilcoxon tests were performed on data that did not meet the normality criteria, with a post hoc Dunn test. To analyze some dependent variables (parafunctional behaviors, psychology, compliance, otological symptoms) logistical and multinomial regressions were used (modeled to test the influence of some parameters on binomial or polynomial dependent variables and mixed linear regression models (modeled to test continuous variables). The normality of posterior residues of the mixed linear models was assessed by Shapiro-Wilk test. Spearman correlation tests were also performed between different variables. The significance of the various tests was considered from a p-value of 0.05.

A few months after the beginning of the study, the statistician estimated that a sample of approximately 100 subjects included after the selection process was enough. He made this estimation on the basis of a preanalysis of the intermediate evaluation (IE) at V2 for 62 subjects. At this point, the patient's OR between V0 and V2 was already significant (improvement of about 45%).

There was no change to trial outcomes after the trial started. The study's protocol respected the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) Guidelines [16]·

Results

The number of subjects with parafunctional behaviors at each visit was as follows: 107 subjects at V1, 98 subjects at V2, 61 subjects at V3 (optional session), and 91 subjects at V4. Sixteen subjects discontinued treatment before the last phase (V4): 5 because of reorientation (insufficient results), 5 for unknown reasons (e.g. missing data), 4 because of life events, 1 for a health problem, and 1 who was satisfied with the treatment received up to that point. The characteristics of the study's participants were outlined in the first article that focused on the population.

Primary outcome measure: OR related to OSMC

The intermediate OR (107 subjects with parafunctions) was evaluated at V2 and V3. At V2, the OR measured reflected the benefit of one therapeutic session (V1) and of implementing the SM program for a whole month. At V3, the OR estimated the benefit of two therapeutic sessions (V1 and V2) and of implementing the SM program for three months. Finally, the final OR, evaluated at V4, measured the benefit of three therapeutic sessions (V1, V2, and V3) and of implementing the SM program for six months. The intermediate OR and the final OR were measured in relation to V0. The mean intermediate OR was 47% (standard deviation (SD): 28% – median (Med): 43%) at V2, and it was 72% (SD: 26% – Med: 77%) at V3. The final mean OR (91 subjects) was 77% (SD: 23% – Med: 85%) (Figure 1). The subjects of the study were divided into three groups, according to the severity of the pain, ranging from a mild situation to a severe situation. This evaluation was based on the parameters used for the primary outcome measure related to pain. (1) A mild situation was classified by two components of pain: frequency and intensity. Pain did not affect the quality of life and did not require medication. (2) A moderate situation was classified by three components of pain: frequency and intensity with either an impact on the quality of life or requiring medications. (3) A severe situation was classified by four components of pain: frequency and intensity with both an impact on the quality of life and requiring medications. There was no significant difference in results depending on the severity of the complaints: mild situation (77.76% OR), moderate situation (77.41% OR), or severe situation (75.40% OR).

The authors analyzed the scores of the two parameters that determine the OR score, shown in Figure 2. At V4, an improvement of 75.43% and 64.37% were noticed in the pain and functional limitation parameters, respectively (Figure 2).

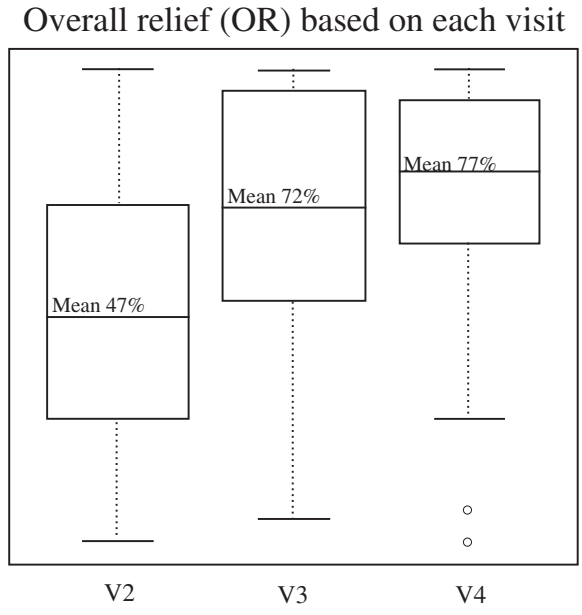


Figure 1. Boxplots of the intermediate evaluation (IE) at visit 2 (V2) and visit 3 (V3). Boxplot of the final evaluation (FE) at visit 4 (V4). The upper limit of the boxplot represents the 3rd quartile (Q3): 25% of the values are higher. The lower limit represents the first quartile (Q1): 25% of the values are lower. The boxplot, therefore, includes 50% of the values. In each boxplot, the horizontal line represents the mean: 47% at V2, 72% at V3, and 77% at V4.

Breakdown of patients in terms of failure, partial success, or total success at the end of the study

The 91 subjects evaluated at the end of the study (FE) were divided into six groups. Figure 3, which illustrates these groups, provides the subjective clinical connotations: therapeutic failure, minimum benefit, moderate benefit, significant benefit, very large benefit, and total success. The percentage of subjects who presented at least a significant OR, ranging from 60% to 100%, was 80.11% (Figure 3).

Putting the results into perspective according to the clinical variants and inter-rater reliability

The practitioners compared the results of homogeneous groups expressing clinical variants. There was no major difference in results between the groups studied in the three distinct situations: (1) variant of work when two specialists were involved (dentist specialized in TMD, followed by the osteopath or logopedist) or when one acted alone (osteopath alone) (p-value 0.493); (2) the multicentric aspect (osteopaths working alone in Belgium (AP), France (CG), and Italy (AB & MS)) (p-value 0.112); and (3) the multi-therapist aspect (different therapists but working in collaboration with the same dentist specialized in TMD in Belgium) (p-value 0.098).

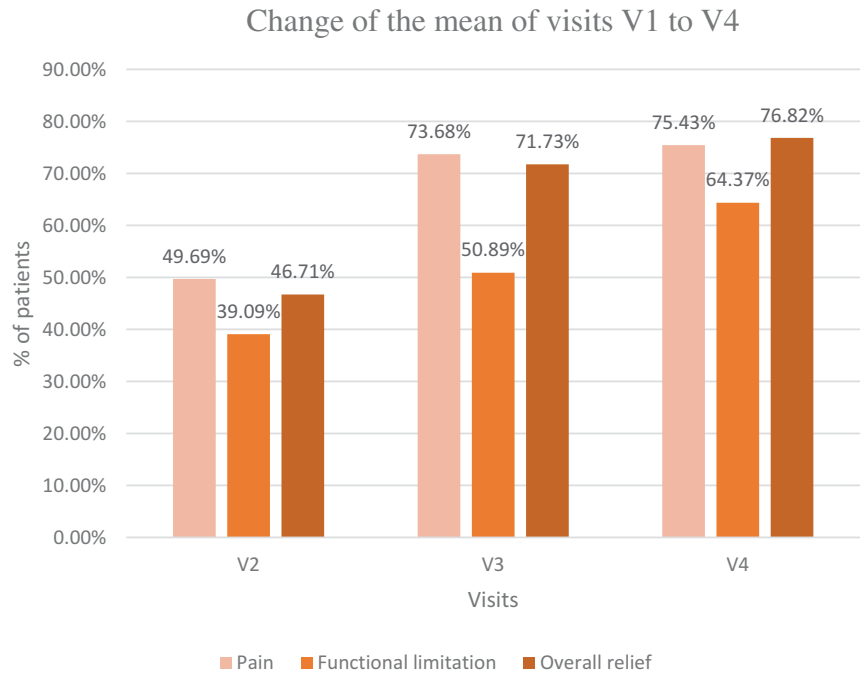


Figure 2. Intermediate evaluation (IE) at visit 2 (V2), visit 3 (V3), and final evaluation (FE) at visit 4 (V4) for pain relief, relief relative to total functional limitation, and overall relief (OR).

Secondary outcome measures: Parafunctional behaviors

The change of parafunctional behaviors was analyzed between V0 and V4. The authors observed that the effect of the sessions was important in decreasing parafunctional behaviors, expressed by the total score of the OBC ($p < .001$). Parafunctional behaviors significantly dropped from V1 to V3 ($p < .001$), as illustrated in Figure 4. There was an insignificant increase in parafunctional behaviors from V3 to V4 (p-value of 1.000). Finally, parafunctional behaviors influenced the OR in a very significant way ($p < .001$) (Figure 4).

Secondary outcome measures: Psychology

Relationship between the patient's psychological state and parafunctional behaviors

A very significant correlation was noticed between parafunctional behaviors and anxiety evaluated by the Hospital Anxiety and Depression Scale (HAD) (p-value < 0.001). However, no major connection was demonstrated between parafunctional behaviors and depression (HAD scale) or the overall Symptom Checklist 90 Revised (SCL90) scores.

Secondary outcome measures: Compliance

The therapists interviewed the subjects at the intermediate phase (IE at V2, V3) and at the end of the study (FE at V4) via a questionnaire to assess their compliance. Compliance was investigated in two aspects: (1) observing parafunctional behaviors and (2) performing learning exercises. The patients had to assign a score from 0% to 100% to these two aspects. The higher the score, the more compliant the patient was to the treatment. The average of all recorded scores (V2, V3, and V4) was 69.56% for the observation and 71.57% for the exercises. A variation in compliance was observed over time, but only in terms of the exercises (77% at V2, 71% at V3, and 66% at V4), while compliance related to the observation remained stable (68% at V2, 70% at V3, and 71% at V4).

Relationship between OR and compliance

The practitioners analyzed the influence of compliance both in terms of observation and the exercises at V2 and V4 on the corresponding OR at these time points. There was no significant correlation between the compliance aspects at V2 with the OR at V2 and V4. There was a very significant link between the compliance with observation at

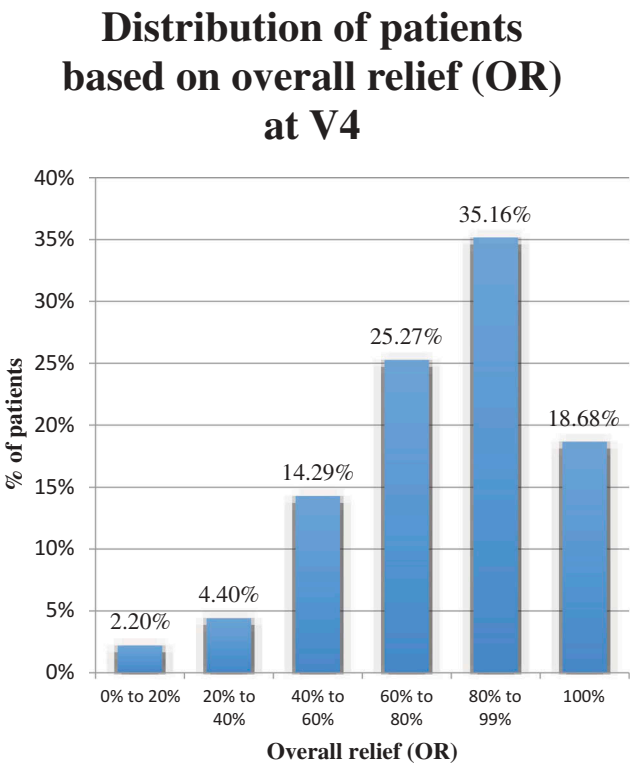


Figure 3. The distribution of 91 subjects analyzed at visit 4 (V4) into 6 groups: (1) Overall relief (OR) from 0% to 20% = therapeutic failure, (2) OR from 20% to 40% = minimal benefit, (3) OR from 40% to 60% = moderate benefit, (4) OR from 60% to 80% = significant benefit, (5) OR from 80% to 99% = very large benefit, and (6) OR of 100% = total success.

V4 and the OR at V4 (p-value = 0.006; correlation coefficient = 0.290) and between the compliance with the exercises at V4 and the OR at V4 (p-value < 0.001; correlation coefficient = 0.346).

Relationship between compliance and the patient's psychological state

A significant correlation was noted between compliance and anxiety by the HAD scale (p-value of 0.021 for observation and 0.019 for exercises). There was also a major increase in compliance in 35% of patients with obsessive-compulsive symptoms observed via the SCL90 (p-value 0.013).

Relationship between compliance and other clinical data

The authors observed a correlation between compliance and the number of sessions; the compliance increased with the number of sessions. However, there was no relationship between compliance and the following two parameters: sex and severity of complaints.

Secondary outcome measures: Otological symptoms

Change in otological symptoms following TMD treatment

Figure 5 shows the strongly observable decrease (p-value > .0001) in otological symptoms from V0 to V4 (Figure 5).

Relationships between otological symptoms and other clinical data

The otological symptoms were unquestionably correlated with arthralgia (p-value: 0.005), while these symptoms were only slightly linked with the following three factors: (1) parafunctional behaviors evaluated by the total score of the OBC (p-value: 0.037), (2) myalgia (p-value: 0.039), and (3) headaches (p-value: 0.012).

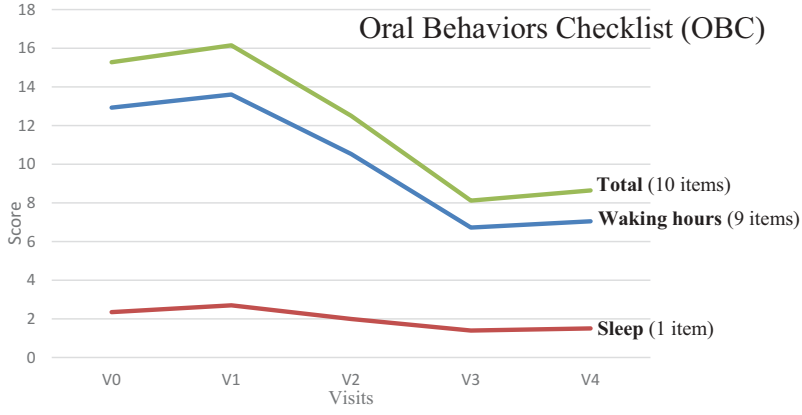
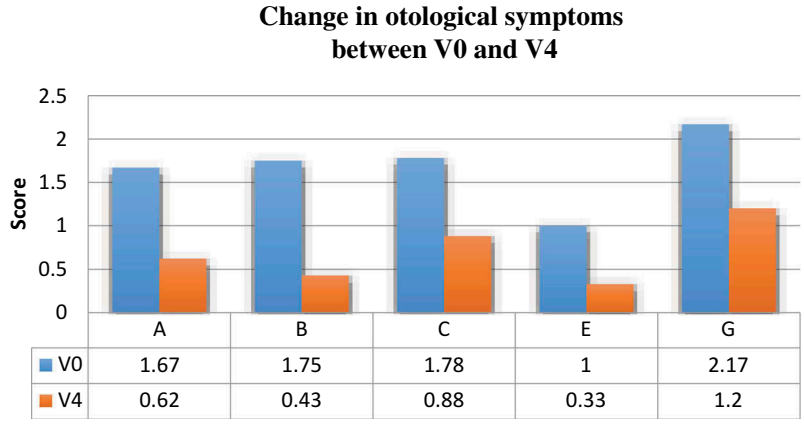


Figure 4. Change of parafunctional behaviors from the prior evaluation (PE) at the first visit (V0/V1) to the intermediate evaluation (IE) at visit 2 (V2), visit 3 (V3), and finally to final evaluation (FE) at visit 4 (V4): average scores of parafunctional behaviors based on the questionnaire Oral Behaviors Checklist (OBC). "Waking hours" represent the average score of the 9 items (3–11 of the OBC) related to the activities of the awakening; "Sleep" is the average score for the sleep activities item (item 1 of the OBC). "Total" is the sum of waking and sleep hours.



	A	B	C	E	G
V0	1.67	1.75	1.78	1	2.17
V4	0.62	0.43	0.88	0.33	1.2

Figure 5. Change in otological symptoms between the prior evaluation (PE) at the first visit (V0) and the final evaluation (FE) at the last visit (V4) for 46 patients who followed the study to the end (V4). The assessment is based on an alteration of the comfort of life (from 0 "not at all" to 4 "yes, extremely"). Five symptoms were assessed: ear fullness (A), reduced hearing (B), hearing too loud (C), hearing the heart (E), and dizziness (G). No patient was concerned by hearing the breath (D) or trembling in the ear (F).

Secondary outcome measures: Subjective impressions

The patients had to assign a score from 0% to 100% (in 10% increments) to the three questions. The higher the score, the better the patient's impression of the treatment. The averages of the different aspects of the 91 scores were as follows: ease of implementation had a score of 79.03%; long-term effectiveness of the treatment, 79.35%; and reuse of treatment in case of recurrence, 89.57%.

No harm or unintended effects were noted.

Discussion

The methodology of the study can be criticized, as this was not a randomized controlled trial (there was no control group), and the validity of the results was dependent on the methodology. However, the authors could not have conducted such a study in the context of their private practices because of the necessity of administering a treatment that was the most effective for a patient. Therefore, the authors decided to do an observational study. Despite this potential bias, this study was very rigorous and presented three major strengths: (1) a very large sample, (2) a multicentric and multi-therapist study, and (3) a record of many parameters, between which several interrelationships were studied. To make it easier to understand the protocol, the IMMPACT recommendations [17] could have been adopted for trial design in pain studies and the Template for Intervention Description and Replication (TIDieR) checklist followed in describing the SM intervention [18]. This could help researchers to improve the methodological quality of future trials.

The OSMC was equally effective in both mild (77.76% OR) and severe (75.4% OR) clinical situations. The results were better in case of pain (75.43%) than in functional limitations (64.37%). The first session resulted in a high OR (47%), and the outcome of the second session was an additional 25% on the average, resulting in an average OR of 72%. The third session was optional and was recommended on a case-by-case basis but was necessary in about one-third of the cases. Even though it is not easy to determine a cutoff above which a treatment is successful, it appeared rather interesting to give a subjective clinical connotation and carefully estimate that an OR, ranging from 60% to 100%, could be considered as a success, at least in the case of a first intention treatment. In this context, the authors observed that 80.11% of the subjects presented an OR ranging from 60% to 100%.

The OSMC is a therapeutic approach successfully applied by different health professionals and is not influenced very much by environmental factors. In this multicentric study, it was interesting to analyze the variation in the results obtained across different sites: in this case, three European countries. The comparison of the results among the three homogeneous groups did not reveal any significant differences. In the context of whether this is a technique achievable by different health professionals, the analysis of the results between two of the homogeneous groups did not show any major differences. The authors did not observe any differences between the groups that were treated by a single specialist or by two specialists together. The appreciation levels of patients regarding the ease of implementation and the impact that treatment could have in the long-term were very positive (scores of about 80%), and the interest displayed toward using

the technique again in case of recurrence was high (score of about 90%). The costs to the patient or to the public health agencies were low and resulted in an excellent profit/cost ratio.

Regarding the analysis of the available scientific literature, the first therapists' interest was in the systematic review (SR) and meta-analysis by List and Axelsson [19]. This allowed them to compare their results to those of other treatments, such as those involving intraoral appliances. For bruxism, the authors concluded that the first SR [20] did not detect any major difference between an occlusal splint, the absence of treatment, and a placebo splint (palatal splint without occlusal covering). The second SR [21] concluded that an occlusal splint delays tooth wear. For intraoral appliances, several SRs concluded that TMD management with a stabilization splint (SS) worn at night probably led to a short-term improvement if the splint was compared to the lack of treatment, but this was inconclusive when the SS was compared to a placebo splint. In the short-term, the SS showed results that are equal to other treatments, such as physical therapy, the behavioral approach, and acupuncture. There was little data available on the long-term effects. Concerning the group of treatments classified as "behavioral treatments and multimodal approaches" [22], to which the OSMC belongs, the authors concluded that all SRs showed an efficacy in treating TMD. Several randomized controlled trials (RCT) showed that behavioral treatments were at least as effective as other conservative treatments [23]. The second therapists' interest from the scientific literature was the results from an international Delphi process about self-management programs in temporomandibular disorders [24]: among the main components identified in the Delphi study, the OSMC experiences education, jaw exercises, the identification, monitoring, and avoidance of the parafunctional behavior. Nutritional recommendations, self-massages, and heat treatment are not used very often. On the other hand, the OSMC seems to stand out by the use of a sensory-motor approach. Finally, the SR of Freitas [4] observed that the association of counseling with interocclusal appliances did not provide additional advantages for TMD treatment. In contrast, when associated with posture training and physical therapy programs, counseling- and self-management-based therapies could provide better results than when these programs were used alone. This treatment philosophy gets close to the one of the OSMC.

Based on the data from the literature and various recommendations [3,24,25], the practitioners stressed the value in considering this type of an SM therapy as a first-line treatment for any subject with a TMD, especially if the subject has parafunctional behaviors (more than 80% of the subjects) and if the situation is chronic.

Parafunctional behaviors were found to be closely associated with TMD, according to the authors' methodology (with caution, in about 81.9% of subjects) (see Part 1 of this article). The evolution of parafunctional behaviors was statistically correlated with the evolution of the symptoms of TMD. The OSMC had significantly reduced the parafunctional behaviors from V1 to V4. At the end of the support (between V3 and V4), the parafunctional behaviors had increased slightly overall. An explanation for this increase is a decrease in the patients' vigilance related to the improvement of the symptoms.

The psychological approach exposed the authors to a quandary. On the one hand, the international recommendations advocate the use of psychometric tests, but on the other hand, the therapists had no recognized competence in psychology. With caution, the analysis of the HAD and SCL90 allowed the authors to present the hypothesis that there was a very significant correlation between parafunctional behaviors and the anxiety evaluated by HAD.

The compliance was high overall. It is believed that developing the new habit of observing oneself can be easily anchored in a highly compliant subject. This could explain the stable and even increasing observation scores observed over time (from 68% to 71%). The decrease in practicing the exercises (from 77% to 66%) was probably related to decreasing symptoms. Compared to the main objective, compliance evolved in an unexpected way. The OSMC requires optimum compliance from the patient. It was supposed that there would be a strong correlation between compliance and therapeutic outcomes. This observation was only partial; the correlation was present at the end of treatment but not at the beginning. It is essential to take into account the psychology of the patient and to avoid the shortcut approach commonly taken, which follows the convention, "severe pain leads to good compliance to treatment." Indeed, no consistent evidence shows that subjects with greater disease severity based on clinical evaluation comply better with medications than healthier ones [26].

One in two patients (52.3%) presented at least one of the seven associated symptoms sought (see Part 1). At the end of the treatment, the otological symptoms were clearly reduced. However, a SR of 2016 [27] remained equivocal about the relationship between the conservative treatment of TMD and the improvement in the otological symptoms.

Conclusion

The primary objective of this study was to assess the effect of OSMC on the OR of patients who had a TMD with parafunctional behaviors. Aware of the study's selected population and methodology, the authors observed that 80.11% of the subjects presented significant OR, ranging from 60% to 100%. They demonstrated that the OSMC was an effective, simple, brief (2–3 sessions), and inexpensive approach, without side effects, for many TMD patients with parafunctional behaviors. The multidisciplinary and multicenter approaches showed that this therapeutic approach could be applied by therapists of various skills and backgrounds. This type of treatment should be generalized since it appears in the international recommendations as the first-line treatment of TMD.

Conflict of Interest

The authors declare no conflict of interest.

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