

# INPLASY PROTOCOL

To cite: Schaefer et al.  
Changes in the Quality of Life  
in Patients undergoing  
Orthognathic Therapy – a  
Systematic Review. Inplasy  
protocol 202330034. doi:  
10.37766/inplasy2023.3.0034

Received: 09 March 2023

Published: 09 March 2023

**Corresponding author:**  
Gregor Schaefer

gregor.schaefer.mz@googlemail.com

**Author Affiliation:**  
Department of Oral and  
Maxillofacial Surgery – Facial  
plastic Surgery, Medical Center of  
the Johannes Gutenberg-University  
of Mainz, Germany Unimedizin  
Mainz.

**Support:** None.

**Review Stage at time of this  
submission:** Completed but not  
published.

**Conflicts of interest:**  
None declared.

## Changes in the Quality of Life in Patients undergoing Orthognathic Therapy – a Systematic Review

Schaefer, G<sup>1</sup>; Jacobs, C<sup>2</sup>; Sagheb, K<sup>3</sup>; Al-Nawas, B<sup>4</sup>;  
Rahimi-Nedjat, RK<sup>5</sup>.

**Review question / Objective:** H1: The combined orthognathic surgical therapy leads to an improved quality of life in patients with dysgnathia. H2: The improvement in the quality of life in patients with dysgnathia is dependent on the Angle class.

**Condition being studied:** Dysgnathia can be divided into congenital or acquired and into symmetrical and asymmetrical. They are also differentiated according to dentoalveolar and skeletal changes. In dentoalveolar dysgnathia, the jaw bases are correctly aligned and the deviation is in the dentoalveolar region in the upper, lower or both jaws. In skeletal dysgnathia, the jaw bases are incorrectly related to the skull base. The dysgnathia can be further divided into transverse, vertical and sagittal changes. While dentoalveolar dysgnathia can often be compensated by pure orthodontic treatment, the correction of skeletal dysgnathia often requires additional oral surgery. In 1899, the orthodontist Edward Hartley Angle introduced the "Classification of malocclusion". He took as a basis the interlocking of the maxillary six-year molars and, based on this, the sagittal relation of the maxillary and mandibular dental arches to each other. From this he derived the different classes into three groups Angle Class 1-3. In our review only patients with a skeletal dysgnathia were included.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 09 March 2023 and was last updated on 09 March 2023 (registration number INPLASY202330034).

### INTRODUCTION

**Review question / Objective:** H1: The combined orthognathic surgical therapy leads to an improved quality of life in

patients with dysgnathia. H2: The improvement in the quality of life in patients with dysgnathia is dependent on the Angle class.

**Condition being studied:** Dysgnathia can be divided into congenital or acquired and into symmetrical and asymmetrical. They are also differentiated according to dentoalveolar and skeletal changes. In dentoalveolar dysgnathia, the jaw bases are correctly aligned and the deviation is in the dentoalveolar region in the upper, lower or both jaws. In skeletal dysgnathia, the jaw bases are incorrectly related to the skull base. The dysgnathia can be further divided into transverse, vertical and sagittal changes. While dentoalveolar dysgnathia can often be compensated by pure orthodontic treatment, the correction of skeletal dysgnathia often requires additional oral surgery. In 1899, the orthodontist Edward Hartley Angle introduced the "Classification of malocclusion". He took as a basis the interlocking of the maxillary six-year molars and, based on this, the sagittal relation of the maxillary and mandibular dental arches to each other. From this he derived the different classes into three groups Angle Class 1-3. In our review only patients with a skeletal dysgnathia were included.

## METHODS

**Search strategy:** The search terms used were (orthognathic surgery OR dentofacial deformity) AND (psychosocial OR quality of life) in the databases "PubMed", "Mediline", and "Google Scholar".

**Participant or population:** All patients with a skeletal dysgnathia were included. Patients with craniofacial deformities, Syndromes, congenital deformities, lip-jaw-palate clefts, secondary deformities after trauma or after tumor diseases were excluded.

**Intervention:** Studies were included if they performed monognathic, bignathic osteotomies or both surgical techniques. Also included were studies with Surgery First, Orthodontic Frist or both treatment approaches.

**Comparator:** Patients' quality of life was measured, for which pre- and

posttherapeutic results of the Oral Health Impact Profile (OHIP) or the Orthognathic Quality of life Questionnaire (OQOL) were compared.

**Study designs to be included:** Aim of this study was to investigate the impact of orthognathic therapy on patients' quality of life. Therefore a systematic review was conducted including all prospective studies that compared pretherapeutic and posttherapeutic Oral Health Impact Profile (OHIP) or Orthognathic Quality of life Questionnaire (OQOL) questionnaire scores. Based on the publication of Soh et al., the included studies had to have been published between 2012 and 2021.

**Eligibility criteria:** All prospective studies on dysgnathia therapy and QoL that collected baseline QoL values with pre-therapeutic questioning of the patients were included. Based on the publication of Soh et al., the included studies had to have been published between 2012 and 2021. Only studies conducted in humans were included in the search. As measurement instruments, studies had to have used either the OHIP or the OQLQ to assess quality of life. Similarly, patients were not allowed to have syndromes, congenital deformities, or cleft lip and palate. Studies that addressed secondary deformities after trauma or in tumor conditions were also excluded. In our review, only classic dentofacial deformities were examined.

**Information sources:** In this systematic review literature research was conducted on Pubmed, Medline and Google Scholar. The last search was conducted in December 2021.

**Main outcome(s):** In general, all publications found significant or highly significant improvement rates in the comparison of pre and post therapeutic scores. While the OQLQ studies showed the highest improvement in the social domain and for facial aesthetics, the OHIP based studies showed the lowest numbers for psychological discomfort by the end of the treatment. These observations correlate with our clinical experience since

patients with class II or class III dysgnathia often dislike their facial profile. Both a receding and prominent chin lead to a disproportion of the lower facial third and usually result in worse facial aesthetics commonly leading to reduced self-confidence.

While many of the studies did not differentiate between class II and III patients some authors subclassified their results according to the Angle classes. These publications state that while both classes improve significantly in their quality of life score those with Class III show an even more positive effect with the treatment. Interestingly these studies also show that the patients seem to benefit in different ways. Class II patients show mostly a functional improvement with the reduction of pain while Class III patients benefit with the reduction of psychological discomfort.

#### Quality assessment / Risk of bias analysis:

Two review authors independently assessed the risk of bias. The allocation was made in a concealed manner. Participants, personnel and outcome assessors were blinded.

**Strategy of data synthesis:** Data were collected with Excel 16.43 (Microsoft Corp., Redmond, WA, USA) and then transferred to SPSS Statistics 22.0 (IBM Corporation, Armonk, NY, USA). Subsequently, the articles were imported into Endnote X9 software (Thompson Reuters, Philadelphia, PA, USA). Correlations were calculated with t-test for normally distributed and Mann-Whitney-U-test for not-normally distributed variables.

**Subgroup analysis:** None.

**Sensitivity analysis:** None.

**Country(ies) involved:** Germany.

**Keywords:** Quality of life, orthognathic surgery, dentofacial deformity, psychosocial, oral health impact profile, orthognathic quality of life questionnaire.

#### Contributions of each author:

**Author 1 - Gregor Schaefer** - Conceptualization, Methodology, Software, Formal analysis, Investigation, Resources, Data Curation, Writing – Original, Draft Visualization, Funding acquisition.

Email: gregor.schaefer.mz@googlemail.com

**Author 2 - Collin Jacobs** - Conceptualization, Methodology, Validation, Supervision.

**Author 3 - Keyvan Sagheb** - Validation, Supervision, Project administration.

Email: keyvan.sagheb@unimedizin-mainz.de

**Author 4 - Bilal Al-Nawas** - Validation, Supervision, Project administration.

Email: al-nawas@uni-mainz.de

**Author 5 - Roman Kia Rahimi-Nedjat** - Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Resources, Data Curation, Writing – Original, Draft Visualization, Supervision, Project administration, Funding acquisition.

Email: romanrahimi@outlook.de