Quality of Life in Post Ameloblastoma Treatment: A Meta-Analysis

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Abstract

Ameloblastoma was the second most prevalent benign odontogenic tumor in the jaw, particularly the posterior mandible. Large solid/multicystic ameloblastomas necessitate aggressive surgical treatment. Consequently, there were functional, aesthetic, and psychological deficits that could impact oral health-related quality of life (OHRQOL) following treatment.

In this meta-analysis, we provide an update to determine the most affected domain of quality of life in post-ameloblastoma treatment.

PubMed, IEEE, Scielo, CINAHL, Wiley and Google databases were reviewed according to inclusion criteria. Risk of bias was performed for cross-sectional and cohort studies assessing each domain of quality of life post ameloblastoma treatment. Outcomes were recorded based on clinical and radiograph type of ameloblastoma and OHRQOL. The mean difference and effect size of studies were pooled.

From a total of 404 articles, only four were reviewed. Based on 149 cases, males between the ages of 18 and 50 were disproportionately affected by ameloblastoma. The radiograph revealed 75 unicystic and 59 multicystic forms. Ramus towards the angle of the mandible was a common location for ameloblastoma, which was treated by resection and reconstruction with a vascularized fibula flap. On the basis of the UW-QOL, OHIP-14, and OHIP-49 questionnaires, post-ameloblastoma treatment had an impact on every domain of the quality of life instrument ($p<0.01$).

From a systematic review of the patient's quality of life after the treatment of large ameloblastoma, the questionnaire instrument used was OHIP, either OHIP-14 or OHIP-49 and UW-QOL. Based on the appropriateness of quality of life questionnaire, the use of the UW-QOL may be more suitable for ameloblastema cases rather than the OHIP questionnaire. Though, a modification is recommended because most ameloblastoma cases do not require radiotherapy as further treatment. PROSPERO registration number: CRD42021288790.

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Introduction

WHO (2005) defined ameloblastoma as a benign, locally invasive, and aggressive odontogenic epithelial tumor originating from the enamel organ, remnants of the dental lamina, oral mucosal basal cells, or odontogenic cyst epithelial cells.[1] There are 1% of oral and maxillofacial tumors and 11 to 18% of odontogenic tumors in the population.[2] Ameloblastoma was the second most prevalent odontogenic tumor, with clinical characteristics frequently observed between the ages of 20 and 40.[3,4] A 87% of cases involved the mandible, with 66% occurring in the posterior region (ascending ramus to molars). The gender preference of this bone lesion was not detected. This tumor may have exhibited slow growth, asymptomatic characteristics, loose teeth, malocclusion, or facial asymmetry.[5–7] Ameloblastoma could infiltrate the cortical plate continuously into the medullar bone cavity, causing the surrounding tissue to expand.[6] Due to the typically slow growth rate of tumors, they may develop into large lesions that impair both physiological function and facial esthetics.

Clinicoradiological classification of ameloblastoma revealed four subtypes, including solid/multicystic, unicystic, peripheral, and

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desmoplastic.[8] Cystic and solid ameloblastoma was an intraosseous tumor with recurrence-prone clinical behavior.[9-13] Conservative and radical treatment options have been established for ameloblastoma. For cases of the unicystic or peripheral type, conservative management includes enucleation, curettage, and surgical excision with peripheral osteotomy, or other supportive therapy such as cryotherapy or application of Carnoy's solution. For the solid/multicystic type, radical therapy was chosen. Resection of the mandible bone can be accomplished via segmental, marginal, or hemimandibulectomy osteotomy.[14] Although ameloblastoma does not tend to metastasize, due to the nature of ameloblastoma which is locally invasive and aggressive, it is necessary to extend surgery to healthy tissue (1-1.5 cm) to prevent recurrence.[10,13,15-17]

In order to achieve physiological and esthetic function, which have a significant impact on the quality of life of postoperative patients, it would be extremely difficult to reconstruct an impacted jaw defect.[9] Due to the tension of the masticatory muscles and soft tissue contractions, loss of bone continuity can cause the mandible to be drawn into the defect area.[18] Due to the tension of the masticatory muscles and soft tissue contractions, loss of bone continuity can cause the mandible to be drawn into the defect area.[7,9,17,19-21] To restore masticatory and speech functions with the aid of prostheses, comprehensive oral rehabilitation should be performed.[21]

The World Health Organization defines quality of life as a person's perception of their life position, cultural context, and individual life goals, expectations, parameters, and social relationships.[15] It was anticipated that surgical and reconstructive treatment would improve the quality of life in all domains, including physical health and psychosocial status. Oral Health Impact Profile was the most common measure of quality of life employed in dentistry (OHIP). OHIP was created by Slade GD and Spencer AJ in 1994 as OHIP-49, and Slade GD modified it in 1997 to become OHIP-14.[22,23] In contrast, the University of Washington quality of life scale (UW-QOL), published in 1993, is frequently used in head and neck cancer health-related quality of life assessments.[24] This questionnaire has also been used to assess the quality of life in patients undergoing oral surgery.[9,21,23] There are few studies on the quality of life after ameloblastoma treatment, and different surgical and reconstruction techniques may have varying effects.

In this systematic review, we will investigate the quality of life of patients following surgical treatment of ameloblastoma with fibula bone reconstruction. Using the UW-QOL and OHIP instruments, this study aimed to evaluate the affected domains of quality of life status following ameloblastoma treatment.

Materials and methods

The systematic review has been registered to PROSPERO with registration number CRD42021288790. The method used in this study was accordance with the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA). Figure 1 showed the sequence of literature searching using PRISMA.

Selection criteria

PICO(T) strategy was used to define the eligibility criteria, and the following criteria were defined: (P) human subjects diagnosed with ameloblastoma, (I) management of ameloblastoma (resection and reconstruction), (C) null, (O) quality of life (OHIP, UW-QOL), (T) All literature publications in 2011-2021.

Inclusion and exclusion criteria

Human subjects diagnosed with ameloblastoma, published in English, and available in full text with the following study designs: case report, clinical study, clinical trial, randomized clinical trial, multicentre study, and observational study from six databases were included in this study (PubMed, IEEE, Scielo, CINAHL, Wiley and Google). Exclusion criteria included studies with no quality of life scale score.

Search Strategy

Each keywords were determined (Supplement table 1), then the boolean words were applied (Supplement table 2) for 6 databases.

Study selection

One investigator (IG) will screen independently using boolean terms and retrieve the report using the Endnote X9 program. Two researchers (WP and YA) used Microsoft Excel 2019 to select articles based on title and abstract evaluations of inclusion criteria. In the initial screening, a duplicate article was eliminated, and

then screening of titles and abstracts was continued. A total of 63 studies that met the criteria were screened for additional complete manuscripts relevant to the objectives of the research. The systematic review and meta-analysis concluded with the collection and analysis of four journals. All investigators reviewed the outcome prior to assessing the risk of bias.

Risk of bias assessment

Three reviewers (WP, YA, IG) independently assessed the risk of bias of the final four studies included. The Joanna Briggs Institute Critical Appraisal tools for use in JBI Systematic Reviews were used to assess the observational study.

Data extraction

Three investigators (WP, YA, IG) carried out the extraction of data from four literature according to subjects, clinico-radiographycal type of ameloblastoma, site of bone lesion, type of treatment, follow up, and quality of life instrument.

Data analysis

The outcome variables were collected and calculated for each questionnaire domain's score (OHIP, UW-QOL). The average score was computed for continuous data. Due to the high degree of heterogeneity among the included studies, the random-effects model was utilized to pool the data. Using I2 statistics, the heterogeneity levels of the eligible studies were evaluated. There were only four studies included, so subgroup analysis was not performed. Using OpenMetaAnalyst for Windows 10 64-bit (CEBM® Brown University), the effect size of the study was pooled. Due to the low number of studies included in the meta-analysis, sensitivity analysis could not be evaluated.

Results

Study Selection and Characteristics

One independent researcher performed the study selection and discovered 298 studies in the Pubmed database, 94 studies in the IEEE database, six studies in the Scielo database, six studies in the Google database, and none in the CINAHL and Wiley databases. After eliminating duplicates based on the titles of the articles, 401 studies remained. The screening of abstracts resulted in the exclusion of 338 studies that lacked full-text and did not address the quality of life. Total of 63 studies were screened for full-text, and 59 were excluded due to the absence of post-treatment quality of life scoring in ameloblastoma patients. Finally, only four articles met the inclusion criteria and were analyzed, including three studies from China in 2014 and one from Taiwan in 2018. (Figure 1). There are three cross-sectional studies and one cohort study. Since only four studies provided the mean quality of life score, meta-analysis was conducted on these studies.

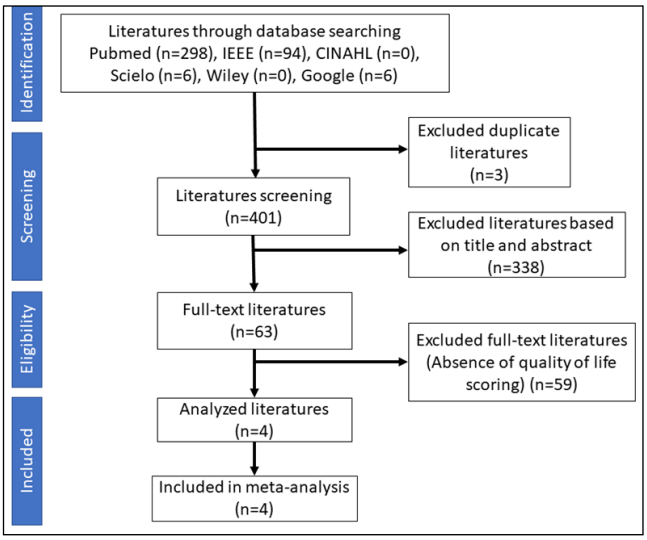

Figure 1. PRISMA Flowchart.

Risk of bias

The study quality evaluation was conducted on the remaining four studies. Only one of the four studies was of cohort design. Li et al.[26], Luo et al.[23] and Zhu et al.[9] reported studies with a moderate risk of bias, while Papalardo et al.[21] reported studies with a low risk of bias (Table 1). In each of the three cross-sectional studies, neither confounding factors nor strategies for addressing this variable were identified, and statistical analysis was unclear. The cohort study by Papalardo et al.[21] lacked identification of confounding factors and strategies to deal with this variable, as well as a description of how to deal with incomplete follow-up.

Data extraction

There were 149 subjects in 4 studies who were predominantly male (59.9 to 73.1%) and younger than 18 years old (Table 2). Three studies (Li et al.[26], Luo et al.[23], and Zhu et al.[9]) collected data 12 months after the operation, while only one study (Papalardo et al[21]) collected

data after 24 months. Papalardo et al[21] only reported clinical symptoms for 36,5 to 41,3 months. Similarly, primary ameloblastomas had a prevalence rate of 55.88% and a recurrence rate of 44.12%. In China, the majority of radiographs were unilocular (59.37 to 68.57%), whereas in Taiwan, the multilocular type predominated (63.63 to 75%). The most prevalent ameloblastoma type was solid (65.62 to 74.29%). Studies in China revealed that the affected region was the ramus towards the angle of the mandible (36% to 42.86%), whereas a Taiwanese study found that the bone lesion was predominant in the premolar to the ramus (29.41%). All reported surgical procedures consisted of mandibular resection followed by reconstruction with a vascularized fibula flap. Only the Papalardo et al[21] study was additionally rehabilitated with dental implants (64.70%). UW-QOL and OHIP instruments, both OHIP-14 and OHIP-49, were the most widely used quality of life instruments. Table 3 showed the mean score of each domain in UW-QOL. Treatment for ameloblastoma impacted twelve domains. Only three domains (activity, chewing, and anxiety) were significantly different between subjects with dental and non-dental rehabilitation, according to a study by Papalardo et al[21]. OHIP was another instrument utilized in four studies. Two domains were significantly affected by ameloblastoma treatment (p<0.05): psychological discomfort and physical disability[21].

Studies	Study Design	1	2	3	4	5	6	7	8	9	10	11	Overall
Li et al[26]	Cross sectional	Y	Y	Y	Y	N	NA	Y	U				Moderate
Luo et al[23]	Cross sectional	Y	Y	Y	Y	N	NA	Y	U				Moderate
Zhu et al[9]	Cross sectional	Y	Y	Y	Y	N	NA	Y	U				Moderate
Pappalardo et al[9]	Cohort	Y	Y	Y	N	NA	Y	Y	Y	Y	NA	Y	Low

Y yes; N no; U unclear; NA not aplicable

Table 1. Risk assessment of bias using the JBI instrument.
Y yes; N no; U unclear; NA not applicable.

Meta-analysis

Supplement Figure 1 shows the result of random effects of the score of each domain of UW-QOL, in the form of forest plot from four studies (Li et al[26], Luo et al[23], Zhu et al[9], Papalardo, et.al.[21]) Forest plot showed the heterogeneity of studies were high on all domains (I^2 more than 76.52%) except appearance in UW-QOL (chi-squared=2.568, p=0.632, I^2=0%). The overall pooled effect of size in all domains UW-QOL were significant. The effect size of each domain was 81.95 [78.51-85.39] for pain; 76.27 [74.58-77.97] for appearance; 72.44 [65.77-79.10] for activity; 74.01 [67.18-80.83] for recreation; 80.27 [77.33-83.21] for swallowing; 38.11 [34.09-42.13] for chewing; 74.90 [68.08-81.73] for speech; 83.16 [80.70-85.61] for shoulder; 80.02 [75.41-84.63] for taste; 76.11 [66.88-85.34] for saliva; 68.20 [65.17-71.22] for mood; and 64.20 [52.75-76.56] for anxiety. The poor category was showed in chewing domain, while moderate category was found in mood and anxiety domains. Other domains showed good category.

Score of each domain of OHIP showed in the form of forest plot. The heterogeneity of studies were high (I^2 >90%) on all domains. The overall pooled effect of size in all domains OHIP were significant. The effect size of functional limitation domain was 44.38 [38.23-50.54]; physical pain domain was 36.37 [22.59-50.15]; psychological discomfort domain was 44.09 [41.87-46.31]; physical disability domain was 53.28 [38.55-68.01]; psychological disability domain was 43.61 [38.29-48.94]; social disability domain was 36.44 [33.70-39.19]; handicap domain was 30.95 [27.70-34.21]). The category for OHIP domains was poor in functional limitation, psychological discomfort, physical disability and psychologic disability; and moderate in physical pain, social disability and handicap.

Discussion

In this study, articles published between 2011 and 2021 regarding the quality of life of patients after treatment for ameloblastoma of varying sizes were analyzed. Only four articles out of 63 that were examined for complete manuscripts met the criteria and were evaluated for quality and risk of bias. All studies were conducted retrospectively with a cross-sectional (3 articles) or cohort study design (1 article). In three articles, quality of life data were collected at 12 months after surgery, and in one article, at 24 months (Table 3, 4). Ameloblastoma is a frequent odontogenic tumor (11-18%). It is nonpathogenic, but there is controversy surrounding its locally aggressive, invading nature, ease of recurrence, and complex biological behavior.[4,5]

Ameloblastomas may also undergo malignant transformations, which frequently result in severe morbidity and even death.[25]

In the search for this article, the most common subject characteristics were found to be male (65.71 to 73%) and female (27 to 40.9%). Ameloblastoma occurs in a variety of age groups, with 82% of cases occurring in those under 50 years of age, especially those under 18 years of age. From various studies, it is known that there is no gender preference and that it typically occurs between the ages of 30 and 60.[6,26] Ameloblastoma in children younger than 19 years of age is extremely uncommon, accounting for only 10 to 15% of all reported cases, which are typically of the unicystic type.[9,27,28] Ameloblastoma is a benign odontogenic tumor with a preference for the mandible, particularly in the region of the molars and ascending ramus, and infrequently anteriorly.[4] Typically diagnosed at age 20 and reported primarily in the third or fourth decade, regardless of gender. Female patients appear to have larger tumors than male patients.[6,29]

Unilocular radiographs are found in 25 to 68.7% while multilocular is 31.43 to 75%. The most prevalent clinical characteristics were solid/multicystic type, with 65.62 to 76%, while unicystic type accounted for 24 to 34.38%. Multilocular ameloblastoma typically exhibits solid/multicystic characteristics; therefore, radical surgery or jaw resection are the only options for preventing recurrence.[4,11]

The mandible is responsible for occlusion, chewing, swallowing, and speech. The degree of functional and aesthetic impairment following mandibular resection is highly dependent on the location and quantity of remaining bone. Large ameloblastomas may necessitate segmental excision or hemimandibulectomy.[13,18,28,30]

Ameloblastoma was found in the mandible in all four of the aforementioned articles, with regional variations as follows: body (22.86 to 26.47%), body-angle (36 to 42.86%), body-angle-ramus (12 to 55.88%), and wide area (17.64%). Around 80-85% of ameloblastoma cases occur in the mandible, specifically the posterior molars, specifically the angle and ramus region, although it can occur in other areas of the mandible.[21,26]

Large ameloblastoma cases in the three articles were treated with segmental resection and simultaneous reconstruction using a fibular free flap, with the criteria of never having serious complications, no previous malignant conditions, no radiotherapy or chemotherapy after reconstruction, and the level of patient satisfaction was measured at least 12 months after reconstruction.[15,25,27] In a different study, mandibular segmental resection and a vascularized fibula osteocutaneous flap were utilized, and patient satisfaction was assessed at least two years later. As a continuation of prosthetic rehabilitation, the patient group was further divided into two subgroups: dentally rehabilitated and nondentally rehabilitated with the use of dental implants. Vascularized bone grafts produce a superior reconstruction compared to nonvascularized and alloplastic bone substitutes when it comes to replacing large bone loss. Using vascular free flaps, a free tissue graft can be extracted with its blood supply intact. Common donor sites include the iliac bone, the fibula, the scapula, and the radius.[5]

The vascularized free fibula flap is the most common technique due to its relatively long size, adaptability, long vascular pedicle with a large diameter, and bone quality. Height and width that are useful for future dental implants and can be used to replace the mandibular bone from the left angle to the right angle.[27] To support masticatory and aesthetic functions, the use of dental implants must be considered, as they can reduce bone resorption and serve as a prosthesis support. At least 5.5 millimeters in thickness and 10 millimeters in height is required for dental implant placement.[5] Occasionally, distraction osteogenesis must be performed after grafting to lengthen the alveolar bone when implants are required or hyperbaric oxygen therapy is used as a supplement to bone reconstruction because it can stimulate angiogenesis and osteogenesis, which is a crucial phenomenon during bone graft fusion.[33-35] Recently, digital surgical techniques, such as surgical navigation and three-dimensional (3D) digital guide technology, have been developed to enhance the precision and minimally invasive performance of contemporary oral surgery.[33] The follow-up period for ameloblastoma management ranges from 12 months to 12 years, with a minimum of 5 years because the recurrence rate remains high despite radical treatment. Nearly fifty percent of patients experience a recurrence within five years, predominantly between two and five years after treatment.[5,34]

Psychological, social, and emotional

factors that affect a person's life on a daily basis are included in oral health-related quality of life. OHIP-14 and OHIP-49 are the instruments most commonly used to assess the quality of life of patients after ameloblastoma treatment in the four aforementioned articles. The OHIP-14 contains fewer questions than the OHIP-49, but retains the original conceptual dimensions of the OHIP-49. The objective of the OHIP instrument is to assess seven aspects of the impact of oral conditions on an individual's quality of life, including functional limitations, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and disability.[21,23,35,36]

In two articles (Li et al.[26] and Zhu et al.[9]), the OHIP questionnaire had the greatest effect on physical disability, whereas in the article by Pappalardo, these dimensions were not affected. This may be the result of different data collection periods, namely the 12th and 24th months, as well as the reconstruction and rehabilitation of prosthetic implants described in Pappalardo's article[18], which improved the patient's quality of life. Another domain regarding the impact of functional limitations appears in only two articles (Luo et al[23] and Zhu et al[9]); this may be due to physical disability, which also has an impact on functional limitations, but does not appear in the research conducted by Pappalardo et al.[21] Unfortunately, data from 1 article is unavailable. The majority of OHIP domains were classified as being in poor or moderate condition. The questions in the OHIP questionnaire appear to be structured to evaluate the general condition of the oral cavity following minor surgery; consequently, when applied to a condition requiring radical surgery, the results may be subpar.

The University of Washington Quality of Life (UW-QOL), which is designed specifically for head and neck cancer patients, is also used in this study for Ameloblastoma disorders, which are aggressive benign tumors caused by the removal of large tumors via radical surgery. Comprises twelve parameters that span the functional, psychological, and social domains.[37] The UWQOL version 4 instrument measures 12 QOL domains in head and neck cancer patients, including pain, appearance, activity, recreation, swallowing, mastication, speech, shoulder, sense of taste, saliva, mood, and anxiety.[38] Due to the fact that the loss of the mandible resulted in the loss of teeth and the ability to chew, according to the article's findings, the masticatory domain became the primary issue affecting the three Chinese artifacts. The installation of dental implants can solve this issue, but it is challenging in Chinese culture because it will lengthen the treatment period, increase the number of surgeries, and ultimately exacerbate financial issues.[26]

After two years postoperatively and reconstruction with or without dental implants, no affected domains were reported in Pappalardo's et al study.[21] This means that after one year, the vascularized fibula graft reconstruction is still unable to satisfy the patient when used for chewing, as dental prosthetics have not been rehabilitated. The next domain that is affected by the reviewed articles is anxiety. This is due to the fact that the majority of adolescent patients (those under the age of 18) are in a poor psychological state, and surgery has a negative effect on them because they feel the need to restrict physical activity.[25,26]

It is necessary to consider social interaction and psychological stress in relation to aesthetic domains that may affect post-surgical appearance. All domains affected by the treatment of ameloblastoma are unquestionably influenced by the patient's perceptions and emotions. The chewing domain was deemed deficient based on forest plot results. This condition may be impacted by the loss of jaw segmental bone, thereby having an effect on ability. The inability to chew may have an effect on the patient's mood, anxiety, and expectations of the rehabilitation process. The primary donor site of the free fibula flap may leave a scar, but because the donor site closure is concealed, patients can readily accept donor site morbidity. Some patients may be concerned about moving the operated limb, reducing their ability to engage in normal activities. The role of the clinician is to provide adequate communication in order to increase patient satisfaction.[39] The clinician's proficiency in dealing with a wide variety of ameloblastoma cases also contributes to the success of surgical and reconstructive management.[40]

The lack of publications discussing the quality of life of patients after ameloblastoma treatment, the collection of quality of life data before and after surgery, and the absence of limits for determining the quality of life data

collection after ameloblastoma surgery are the limitations of this systematic review.

Conclusions

From a systematic review of the patient's quality of life after the treatment of large ameloblastoma, the questionnaire instrument used was OHIP, either OHIP-14 or OHIP-49 and UW-QOL. Based on the appropriateness of quality of life questionnaire, the use of the UW-QOL may be more suitable for ameloblastema cases rather than the OHIP questionnaire. Though, a modification is recommended because most ameloblastoma cases do not require radiotherapy as further treatment.

Declaration of Interest

The authors report no conflict of interest.

Pubmed	IEEE	CINAHL	Wiley	Scielo	Google
• Quality of life • Life Quality • Health-Related Quality Of Life • Health Related Quality Of Life • HRQOL • OHRQoL	• Quality of life • Life Quality • Health-Related Quality Of Life • Health Related Quality Of Life • HRQOL • OHRQoL	• Quality of life • Life Quality • Health-Related Quality Of Life	• Quality of life • Life Quality • Health-Related Quality Of Life • HRQOL	• Quality of life • Life Quality • Health-Related Quality Of Life • Health Related Quality Of Life • HRQOL • OHRQoL	• Quality of life • Life Quality • Health-Related Quality Of Life • Health Related Quality Of Life • HRQOL • OHRQoL
• OHIP • Oral health impact profile	• OHIP • Oral health impact profile	• Oral health impact profile	• OHIP • Oral health impact profile	• OHIP • Oral health impact profile	• OHIP • Oral health impact profile
• Ameloblastomas • Ameloblastoma	• Ameloblastomas • Ameloblastoma	• Ameloblastoma	• Ameloblastomas • Ameloblastoma	• Ameloblastomas • Ameloblastoma	• Ameloblastomas • Ameloblastoma

Supp Table 1. Keywords used to search various databases.

Database / Criteria	Date	Total	Syntax
Pubmed Criteria: • Full text • Case report • Clinical study • Clinical trial • RCT • Multicentre study • Observational study • Human • English • 10 years	11 Nov 2021	298	((((((((Quality of life[Title/Abstract]) OR (Life Quality[Title/Abstract])) OR (Health-Related Quality Of Life[Title/Abstract])) OR (Health Related Quality Of Life[Title/Abstract])) OR (HRQOL[Title/Abstract])) OR (OHRQOL[Title/Abstract])) OR (ohip[Title/Abstract])) OR (oral health impact profile[Title/Abstract])) AND (Ameloblastomas[Title/Abstract])) OR (Ameloblastoma[Title/Abstract])
IEEE Criteria: • Type journals • 2011-2022 • Publisher IEEE • Publication type: Disease • Publication type: Health care • Publication Access: IEEE Access • Publication Access: IEEE Journal of Biomedical and Health Informatics	1 Nov 2021	94	("Abstract":Quality of life) OR ("Abstract":Life Quality) OR ("Abstract":Health-Related Quality Of Life) OR ("Abstract":Health Related Quality Of Life) OR ("Abstract":HRQOL) OR ("Abstract":OHRQOL) OR ("Abstract":ohip) OR ("Abstract":oral health impact profile) AND ("Abstract":Ameloblastomas) OR ("Abstract":Ameloblastoma)
CINAHL (EBSCO)	1 Nov 2021	0	"quality of life" OR "life quality" OR "Health-Related Quality Of Life" OR "oral health impact profile" AND "Ameloblastoma"
Wiley	11 Nov 2021	0	"Quality of life" in Title and "Life Quality" in Title and "Health-Related Quality Of Life" in Title and "HRQOL" in Title and "ohip" in Title and "oral health impact profile" in Title and "Ameloblastoma" in TitleQuality of life
Scielo	1 Nov 2021	6	(ti:((quality of life) OR (life quality) OR (Health-Related Quality Of Life) OR (Health Related Quality Of Life) OR (HRQOL) OR (OHRQoL) OR (ohip) OR (oral health impact profile) AND (Ameloblastomas) OR (Ameloblastoma)))
Google	11 Nov 2021	6	(Quality of life) OR (Life Quality) OR (Health-Related Quality Of Life) OR (Health Related Quality Of Life) OR (HRQOL) OR (OHRQOL) OR (ohip) OR (oral health impact profile) AND "(Ameloblastomas)" OR "(Ameloblastoma)"

Supp Table 2. Syntax and criteria used for publication searching.

Studies	Country	Study Design	Subject	Radiograph appearance	Type ameloblastoma	Region	Type treatment	Follow up (month)	Intrument	Conclusion
Li et al (2014)	China	Cross sectional	1 group (n=35) Male vs female = 23 (65.71%) vs 12 (34.29%) Age <18 y.o. n=26 (74.29%) 18-24 y.o. n=9 (25.71%)	Uniloc n=24 (68.57%) Multiloc n=11 (31.43%)	Unikistik n=9 (25.71%) Solid n=26 (74.29%)	Body to angle n=15 (42.86%) Body angle ramus n=12 (34.28%) Body n=8 (22.86%)	Mandible resection and reconstruction with free fibula flap	12-32	UW-QOL, OHIP-14	Mandibular reconstruction with a free fibula flap significantly influenced the adolescent patient QOL.
Luo et al (2014)	China	Cross sectional	1 group (n=47) Male vs female = 23 (71.88%) vs 9 (28.12%) Age <18 y.o. n=18 (56.25%) 18-30 y.o. n=14 (43.75%)	Unilocular n=19 (59.37%) Multilocular n=13 (40.63%)	Unicystic n=11 (34.38%) Solid n=21 (65.62%)	Body, angle = 13 (40.63%) Body, angle, ramus n= 11 (34.37%) Body n=8 (25%)	Mandible resection and reconstruction with free fibula flap	16 - 123	UW-QOL, OHIP-49	A significant effect was found on the HRQOL of young patients with huge ameloblastoma who had undergone immediate mandible reconstruction with free fibula
Zhu et al (2014)	China	Cross sectional	1 group (n=33) Male vs female = 24 (73%) vs 9 (27%) Age <50 y.o. n=27 (82%) ≥50 y.o. n=6 (18%)	Uniloc n=21 (64%) Multiloc n=12 (36%)	Unicystic n=8 (24%) Solid n=25 (76%)	Body, angle n=12 (36%) Body, angle, ramus n=4 (12%) Body only n=17 (52%)	Mandible resection and reconstruction with free fibula flap	14 - 60	UW-QOL, OHIP-14	Mandibular reconstruction with a fibular free flap significantly influenced the patient QOL and oral function.
Pappalardo et al (2018)	Taiwan	Cohort	2 groups A: dental rehabilitated (n=22) Male vs female = 13 (59.09%) vs 9 (40.90%) Age (mean) = 32.3 ± 12.7 y.o. B: nondental rehabilitated (n=12) Male vs female = 8 (66.67%) vs 3 (33.33%) Age (mean) = 34.7 ± 15.7 y.o.	A: Unilocular n=8 (36.36%), multilocular n=14 (63.63%) B: Unilocular n=3 (25%), multilocular n=9 (75%)	A: Unicystic n=6 (27.27%), solid/multicystic n=16 (72.72%) B: Unicystic n=4 (33.33%), solid/multicystic n=(66.66%)	Symphisis-molar A vs B = 5 vs 2 Symphisis-ramus A vs B = 2 vs 1 Molar-ramus A vs B = 1 vs 5 Premolar-molar A vs B = 2 vs 0 Premolar-ramus A vs B = 8 vs 2 Wide area A vs B = 4 vs 2	Mandible resection and reconstruction with fibula osteoseptocutaneus flap A: followed by dental implant placement B: no dental implant	A: 100.2 ± 42.1 B: 68.8 ± 45.8	UW-QOL, OHIP-14	Vascular bone graft reconstruction followed by immediate or delayed placement of osseointegrated implants showed as an ideal and predictable treatment modality for patient with ameloblastoma

Table 2. Study characteristics and quality of life of ameloblastoma.

Studies	Group	Pain	Appearance	Activity	Recreation	Swallowing	Chewing	Speech	Shoulder	Taste	Saliva	Mood	Anxiety
Li et al (2014)		82.21 ± 5.78	78.12 ± 11.56	69.48 ± 7.56	68.21 ± 10.59	77.32 ± 6.77	28.48 ± 3.18	71.26 ± 12.57	80.29 ± 9.01	71.23 ± 8.76	60.02 ± 7.62	67.09 ± 1.15	55.76 ± 8.23
Luo et al (2014)		80.56 ± 7.45	76.24 ± 8.68	66.16 ± 9.08	69.39 ± 7.09	78.10 ±5.09	30.33 ± 2.68	66.36 ± 7.83	82.26 ± 3.14	78.65 ± 7.53	74.09 ± 8.03	60.12 ± 2.95	45.28 ± 9.56
Zhu et al (2014)		76.4 ± 6.5	74.6 ± 9.6	64.1 ± 8.3	65.6 ± 8.7	79.2 ± 7.2	32.4 ± 1.8	68.8 ± 9.9	81.1 ± 5.5	80.5 ± 5.5	75.0 ± 9.7	67.1 ± 1.2	65.2 ± 8.6
Pappalardo et al (2018)	Dental	87.5 ± 16.8	79.6 ± 19.9	88.6 ± 12.7	89.8 ± 12.6	90.5 ± 14.3	86.4 ± 22.8	89.1 ± 14.8	91.8 ± 13.7	89.1 ± 14.8	90.5 ± 14.3	86.4 ± 15.3	87.7 ± 15.1
	Non dental	89.6 ± 12.9	75.0 ± 18.5	77.1 ± 19.8	81.3 ± 21.7	86.7 ± 22.3	62.5 ± 29.2	82.5 ± 15.5	90.0 ± 14.8	85.0 ± 15.7	84.2 ± 22.3	79.2 ± 21.5	72.5 ± 27.7
		p = 0.36	p=0.26	p=0.02*	p=0.08	p=0.27	p=0.01*	p=0.11	p=0.36	p=0.23	p=0.16	p=0.13	p=0.02*

Table 3. The mean score of each domain using the UW-QOL instrument.

Studies	Group	OHIP	Functional limitation	Physical pain	Psychological discomfort	Physical disability	Psychological disability	Social disability	Handicap
Li et al (2014)		OHIP-14	NI	NI	NI	NI	NI	NI	NI
Luo et al (2014)		OHIP-49	56.23 ± 5.79	35.26 ± 3.36	44.38 ± 1.78	76.08 ± 3.42	52.07 ± 6.67	38.82 ± 1.90	36.36 ± 2.89
Zhu et al (2014)		OHIP-14	52.1 ± 1.7	54.2 ± 1.9	46.3 ± 1.2	71.1 ± 9.5	48.9 ± 2.0	40.8 ± 1.3	34.3 ± 1.2
Pappalardo et al (2018)	Dental	OHIP-14	23.2 ± 20.2	22.6 ± 18.2	26.1 ± 21.5	22.2 ± 21.7	26.7 ± 20.5	19.3 ± 15.1	15.3 ±13.4
	Non dental		28.1 ±23.7	31.3 ± 24.7	37.5 ± 23.3	38.5 ± 23.3	30.2 ± 22.1	26.0 ± 20.2	21.9 ± 22.5
			p=0.19	p=0.05	p=0.02*	p=<0.01**	p=0.26	p=0.06	p=0.07

Table 4. The mean score of each domain using the OHIP instrument.

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