"Dental Malocculsion Among Adult Patients With Cleft Lip And Cleft Palate: A Systematic Review"

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ABSTRACT: Malocclusion is a common oral disease affecting children with various reported prevalence rates. This systematic review aimed to determine the epidemiological characteristics of malocclusion among adults with cleft lip and cleft palate. The frequency of agenesis of the second premolar, hypodontia of the lateral incisor, congenital absence of the lateral incisor, supernumerary teeth, agenesis of the lateral incisor, and other anomalies like inter canine and intermolar width, microdontia, and enamel hypoplasia was estimated to be 40%, 50%, 30%, 7.3%, 31.1%, 4.4%, and 4.9% of adult patients between the ages of 12 and 18 years, respectively. Additionally, there was slight difference in malocclusion by gender. Although this study represents a narrow view of malocclusion of adults with cleft lip and cleft palate. The results provide sample evidence that can aid clinicians and towards early prevention and timely treatment.

KEY WORDS: Cleft lip, Cleft Plate, Malocclusion, Angle's Malocclusion, Dental anomalies, Lateral incisors, Open bite, Crowding, Parafunctional habits, Appliance.

INTRODUCTION:

Oral health issues such as cleft lip and cleft palate will affect the functional, aesthetic, and psychological limitations among the cleft lip and cleft palate patients represent a dental public health concern. Individuals with oral clefts are more likely to have malocclusions, which promote the accumulation of dental plaque on tooth surfaces and increase the risk of developing several oral disorders, including caries[1].

Patients with abnormalities may have more severe oral health issues in addition to being physically, socially, or mentally challenged due to either an underlying medical condition or an actual handicap. Clinical issues that affect children with cleft lip and cleft palate include attrition, occlusal interference, delayed tooth eruption, tongue intrusion that obstructs mastication, dysfunction of the temporomandibular joint, periodontal issues, and heightened susceptibility to dental caries. Despite this, the parents and patients of these patients place greater emphasis on surgically correcting cleft defects and disregard other oral health issues, such as functional disorders like malocclusion[2.]

Numerous dental abnormalities are associated with cleft lip and cleft palate, and these conditions can have a long-term effect on a patient's face structure and self-esteem. Research has indicated that the dental anomaly is more common on the cleft side and that it may impact both permanent and deciduous teeth. In the cleft region, the maxillary lateral incisors are particularly vulnerable to dental anomalies[3.]

The prevalence of dental malocclusion in adult individuals with cleft lip and cleft palate has not been the subject of any prior research. In order to evaluate dental malocclusion with cleft lip and cleft palate in individuals 18 years of age and older, a systematic review is being conducted in this study with the primary objective to determine how common dental malocclusions are in adult cleft lip and cleft palate patients.

METHODOLOGY:

TABLE 1.PICO WORKSHEET THAT DEFINED THE RESEACH QUESTION QUESTION OF THE PRESENT STUDY:

(POPULATION, INTERVENTION, COMPARISON, AND OUTCOME).

P-POPULATION (Cleft lip and Cleft palate)	Palatal birth defect Palatal deformation Palatal deformity Orofacial cleft Palatoschisis Harelip Cheiloschisis
I- INTERVENTION (Malocclusion)	Malpositioned teeth Crowded teeth Malaligned teeth Irreugular teeth Overjet Overbite Crossbite
C- COMPARISON	Nil
O-OUTCOME (Effect of intervention)	Class 2 malocclusion Crossbites Class 3 malocclusion High prevalence lateral or central incisor Presence of ectopic teeth in c left area Congenital absence of cleft side lateral incisor Second premolar agenesis

Research question of the present study was what percentage of adult patients with cleft lip and cleft palate have dental malocclusion?

ELIGIBILITY CRITERIA:

The inclusion criteria of the systematic review includes Studies conducted on participants with cleft lip or cleft palate anomaly or with both the anomalies together, The Exclusion criteria consists of Studies conducted on participants that possess any form of prosthesis or orthodontic appliance in oral cavity will be excluded from this study, Studies conducted on mentally ill patients on patients with any systemic illness will be excluded from this study.

CONDITION OR DOMAIN BEING STUDIED:

Young patients known to have malocclusion but in this project adult related malocclusion to be studied. In order to determine the prevalence of malocclusion in adult patients with cleft lip and cleft palate, the malocclusion in this project is characterized using Angle's classification system in addition to other methods.

PARTICIPANTS:

Adult Cleft lip and Cleft palate patients aged 18 years above.

INTERVENTIONS:
Asses the severity of malocclusion among cleft lip patients.

COMPARISON:
Nil

OUTCOMES:
Primary outcome: Patients with cleft lip and cleft palate were shown to have a high prevalence of malocclusion**.**

Secondary outcome: Disparities in severity between individuals who have both cleft palates and lips were identified.

Prospero Registration: CRD42024510817

DATA EXTRACTION (SELECTION AND CODING):
Every included study that was received, along with the complete texts that met the inclusion criteria, combined with the year of publication and the first author were examined by the independent investigator (AB) and co-investigator (PAT). One reviewer pair narrowed down the search results by only looking at the title and abstract after conducting the search in the aforementioned databases. At this point, no attempt was made to access the article's entire text. Following the screening, the two reviewers' decisions were compared, and disagreements were resolved through conversation. After that, the two reviewers each extracted data independently from the entire text of the chosen articles.

RISK OF BIAS (QUALITY) ASSESMENT:
After reading the entire manuscript, two reviewers evaluated the studies' risk of bias separately. The "Cochrane Handbook for Systematic Review of Intervention," a Cochrane technique for evaluating bias risk, was applied. Inconsistencies in the two reviewers' decisions were settled by mutual conversation or by seeking the advice of another expert.

WE WILL CAREGORIZE THE RISK OF BIAS AS:
1)If all requirements were satisfied and the conceivable bias was not expected to have had a significant impact on the review's findings, the risk was minimal.
2) There was a chance that bias would have an impact on the study's findings if one or more criteria were deemed unclear.
3) If one or more of the criteria were not met, there was a substantial chance of bias, which could have had a negative impact on the study's findings.

1) **Language:**English

KEYWORDS:
1. Cleft lip
2. Cleft palate
3. Malocclusion
4. Angle's Malocslusion
5. Dental anomalies
6. Lateral incisors
7. Open bite
8. Crowding
9. Parafunctional habits
10. Appliance

SEARCHES:

The following databases were searched by the investigator (AB) and co-investigator (PAT): Pubmed, Web of Science, Scopus, and The Cochrane Library, EBSCO, Ovid, and Wiley's Online. No publication date restrictions were imposed, and only English-language studies were taken into consideration.

• The Clinical Trials.Gov registry (www.clinicaltrials.gov) was searched to locate ongoing and unpublished trials.

SEARCH STRATEGY:

The search approach was based on free keywords paired with Boolean operators and the regulated vocabulary (Mesh Terms) of the Pubmed database.

• Boolean operators [AND] and [OR] was used to combine the PICO question's "participant" and intervention notions.

THE FOLLOWING KEY WORDS WAS USED:

To get studies from the databases, several search phrases and key words was utilized. Search terms including "cleft lip," "cleft palate," "open bite," "crowding," "angle's malocclusion," "dental anomalies," "lateral incisors," "parafunctional habits," and "appliance" were used to find studies. "systemic review," "assesses the prevalence of malocclusion."

STRATEGY FOR DATA SYNTHESIS:

Data synthesis that is qualitative and takes into account the index's median, interquartile range, and mean as well as standard deviation from each main study. Intention-to-treat analysis would be used to undertake the synthesis of descriptive data. At any stage during the investigation, participants who were lost to follow-up was taken into consideration.

TABLE 2: PUBMED DATABASE

DATE OF SEARCH	4/3/2024-23/3/2024
NAME OF DATABASE	PUBMED
PLATFORM	MEDLINE
SEARCH	(((((((("cleft lip"[MeSH Terms] OR (("palate"[MeSH Terms] OR Palatal[Text Word]) AND ("congenital abnormalities"[MeSH Terms] OR birth defect[Text Word]))) OR (Orofacial[All Fields] AND cleft[All Fields] OR "cleft palate"[MeSH Terms]) OR (("palate"[MeSH Terms] OR Palatal[Text Word]) AND ("congenital abnormalities"[MeSH Terms] OR deformity[Text Word]))) AND ("tooth"[MeSH Terms] OR teeth[Text Word])) OR "malocclusion"[MeSH Terms]) OR ("tooth"[MeSH Terms] OR teeth[Text Word])) OR (Over[All Fields] AND jet[All Fields])) OR ("overbite"[MeSH Terms] OR Overbite[Text Word])) OR ("malocclusion"[MeSH Terms] OR Cross bite[Text Word])) OR "tooth abnormalities"[MeSH Terms]) OR (Class[All Fields] AND 2[All Fields] AND ("malocclusion"[MeSH Terms] OR malocclusion[Text Word]))) AND ("malocclusion"[MeSH Terms] OR Cross bite[Text Word])) OR (Class[All Fields] AND 3[All Fields] AND ("malocclusion"[MeSH Terms] OR malocclusion[Text Word]))) AND (("congenital"[Subheading] OR Congenital[Text Word]) AND absence[All Fields] AND cleft[All Fields] AND side[All Fields] AND lateral[All Fields] AND ("incisor"[MeSH Terms] OR incisor[Text Word]))) OR (Second[All Fields] AND ("bicuspid"[MeSH Terms] OR premolar[Text Word]) AND ("abnormalities"[Subheading] OR agenesis[Text Word]))) OR ((High[All Fields] AND prevalent[All Fields] AND lateral[All Fields]) OR (central[All Fields] AND ("incisor"[MeSH Terms] OR incisors[Text Word]))))

NUMBER OF ARTICLES	136

OVID DATABASE

DATE OF SEARCH	10/4/2024-29/4/2024
NAME OF DATABASE	OVID
PLATFORM	MEDLINE
SEARCH	(((cleft plate AND congenital abnormalities AND class 2 malocclusion) OR crossbite OR second premolar agenesis).
NUMBER OF ARTICLES	71

COCHRANE LIBRARY DATABASE

DATE OF SEARCH	2/5/2024-17/5/2024
NAME OF DATABASE	COCHRANE LIBRARY
PLATFORM	COCHRANE LIBRARY
SEARCH	(cleft plate AND congenital abnormalities AND class 2 malocclusion) OR crossbite OR second premolar agenesis OR congenital absence of lateral incisor):ti,ab,kw
NUMBER OF ARTICLES	149

EBSCO DATABASE

DATE OF SEARCH	7/6/2024-24/6/2024
NAME OF DATABASE	EBSCO
PLATFORM	CINAHL
SEARCH	"cleft palate OR palatal defect OR palatochisis AND crowded teeth OR malaligned teeth OR malpostioned teeth AND class 2 malocclusion OR crossbites OR overjet OR overbite"
NUMBER OF ARTICLES	87

WILEY'S ONLINE DATABASE

DATE OF SEARCH	1/07/2024-19/7/2024
NAME OF DATABASE	Wiley's Online Library
PLATFORM	Wiley's Online Library Platform
SEARCH	" cleft plate AND congenital abnormalities AND class 2 malocclusion) OR crossbite OR second premolar agenesis OR congenital absence of lateral incisor " anywhere
NUMBER OF ARTICLES	47

RESULTS :

The PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) guidelines for openly disclosing meta-analyses and systematic reviews were followed in the conduct of this systematic review. The participants (cleft lip and palate patients), interventions (malocclusion), comparisons (nil), outcomes (impact of intervention), and study methodology (prevalence study) were identified to define the scope of this review using the framework of a PICO question.In October 2020, searches were made utilizing internet databases, including Pubmed, The Cochrane Library, EBSCO, Ovid, and Wiley's Online Library.

Other language papers were not accepted because the author found it difficult to evaluate them. In the later step of article selection, papers that were found using the keywords were thoroughly examined, and reports that were not relevant were discarded.Eleven articles of prevalence studies that satisfied our inclusion criteria were found through our literature search; they included two

unpublished or continuing trials. The research A systematic review was conducted to evaluate dental malocculation in adult patients with cleft lip and cleft palate. Since several of the studies' abstinence criteria varied greatly, no meta-analysis was done for the included trials. The study features of the included studies were stated in Table-1. In most trials, safety information was provided. The main categories of these data were side effects that were bothersome and therapy termination.

PRISMA GUIDELINES:

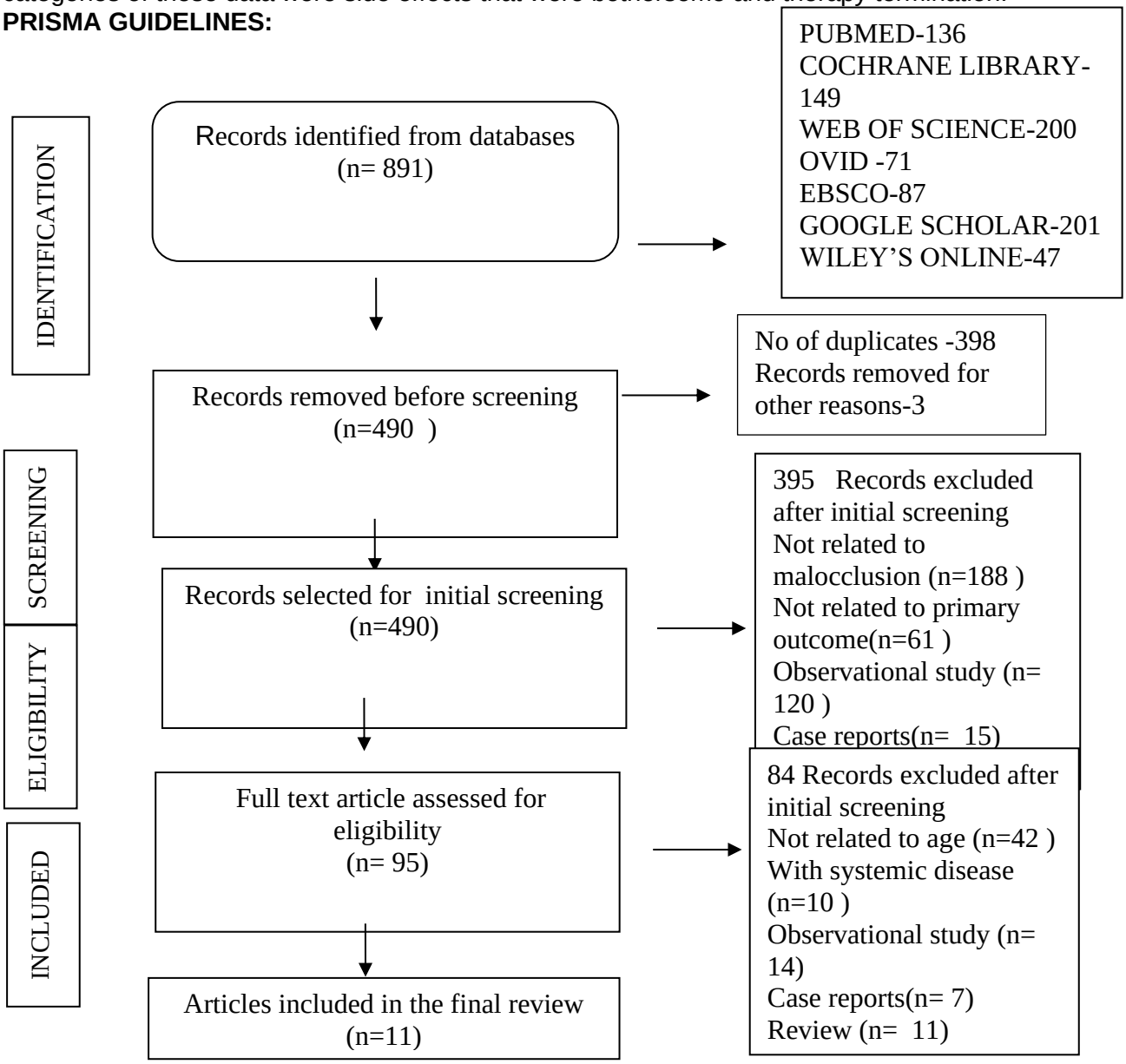


FIGURE 1: STUDY SELECTION FLOW DIAGRAM

TABLE 3: FEATURES OF THE STUDIES THAT WERE INCLUDED

Reference	Year	Country	Design	Participants(N)	Interventions	Primary Outcome	Secondary Outcome
R. Rullo et al	2015	Italy	Cross-sectional Study	A sample of 90 Caucasian children (59 boys and 31 girls) with isolated cleft lip and unilateral or bilateral cleft lip and palate, Cleft patients included in this study were born between 1990 – 2008, with a median age of 10 years (range 4-20), and did not show an associated syndrome or relevant medical diseases.	Nil	High frequency of dental abnormalities, primarily affecting the anterior maxillary teeth, which are the site of the cleft.	
Agentamarcusson et al	2004	Europe		The content included study models from 39 individuals with complete UCLP—25 men and 14 women. .	Nil	Early in adulthood, the width and length of the maxillary arch decreased in subjects with treated UCLP.	
Chiara Tortora, et al	2007	Italy		Panoramic radiographs of 116 nonsyndromic Caucasian patients, 87 UCLP patients, and 29 BCLP patients (mean age, 12.0 years; range, 4 to 20 years) made up the sample.	Nil	Most of the time, there appears to be a similar reason for dental anomalies that vary in number, size, form, and cleft location. Dental abnormalities, particularly those involving congenitally absent teeth, present an	

						extra challenge for cleft patients' treatment planning.	
Aiyesha Wahaj et al	2015	Karachi		The 64 participants in total, aged 14 to 16 [mean age group 14.7 ±0.68 years for both cleft and normal subjects; 50% cleft and 50% normal subjects], were split into two groups for this cross-sectional study: 32 individuals with cleft lip and palate made up Group 1 (16 with complete unilateral and 16 with complete bilateral cleft lip and palate). Thirty-two subjects, both male and female, with class I occlusion and normal facial morphology made up Group 2.	Nil	Comparing individuals with unilateral and bilateral cleft lip palate to the normal occlusion class I group, the maxillary arch is noticeably narrower. When compared to the normal class I occlusion group, only intercanine width in the mandibular arch showed a significant ($p < 0.001$) reduction in both the unilateral and bilateral cleft lip palate groups.	
Rebecca Chapman, et al	2019	New zealand		Sixty consecutive teenage orthodontic patients who had treatment made up the study sample. Patients with severe or incapacitating malocclusions (mean age 14.7+/-1.8) who were not cleft	Nil	There was no discernible relationship between OHRQoL and the results of clinical treatment.	

				adolescent patients (N = 27) or cleft adolescent patients (CL/P) (mean age 12.1+/- 2.0) who had orthodontic treatment as part of their multimodal cleft therapy (N = 33) were the two groups of participants.			
Anna Paradowska-Stolarz et al	2014	Poland		Thirteen of the patients (17 women and 19 males) had bilateral cleft lip and palate (BCLP). There were 87 patients (36 women and 51 men) with unilateral clefts on the left side (CLP-L) and 31 instances (eight women and 23 men) with unilateral clefts on the right side (CLP-R). There were 151 patients in the control group 96 women and 55 men.	Nil	Individuals with clefts do not typically have discrete dental defects, but they do more often than the general population represent crossbites. Distal occlusion is frequently observed in noncleft patients, whereas class III malocclusions predominate in cleft patients.	
G.dewinter et al	2003	Belgium and Netherland		The age range of the UCLP patients was 8 to 20. Thirty patients (group A) were not yet receiving active orthodontic treatment; thirty-four patients (group B) were receiving active	Nil	According to this study, patients with UCLP in group C had a final periodontal and dental outcome that is encouraging and supports	

				orthodontic treatment with either fixed or removable appliances; and eleven patients (group C) were in the retention phase.		the need for long-term therapy.	
M. Okan Akcam et al	2006	Turkey		Orthodontic dental casts from 125 patients were split into four groups: group 1 (control) Class I (20 subjects, 9 males, 11 females, mean age 18.3 years); group 2 (ULCLP) (34 subjects, 16 males, 18 females, mean age 17.5 years); group 3 (URCLP) (18 subjects, 8 males, 10 females, mean age 16.9 years); and group 4 (BCLP) (20 subjects, 25 males, 27 females, mean age 15.9 years).	Nil	In comparison to Class I individuals, the MD, LL, and OG dimensions of CLP patients were generally smaller, with the exception of the maxillary and mandibular premolar MD dimensions. (The CLP patients had greater maxillary and mandibular premolar MD measurements.)	With the exception of the maxillary and mandibular premolar MD dimensions, the MD, LL, and OG measurements of CLP patients were generally smaller than those of Class I persons. (The maxillary and mandibular premolar MD measures were higher in the CLP patients.)
Celikoglu M et al	2015	Turkey		28 patients (19 males and 9 females; mean age: 13.27±3.68 years) and 22 patients (14 males and 8 females; mean age: 14.26±2.61 years) with UCLP were included in the sample.	Nil	All patients affected by UCLP and BCLP had at least one maxillary dental anomaly.	Tooth agenesis was the most common maxillary dental anomaly in both the UCLP (92.5%) and BCLP (86.4%) groups.

							Canine impaction was the second most common anomaly, occurring in 42.9% and 27.3% of cases, respectively, with no significant difference between them. • In patients affected by UCLP, tooth agenesis and canine impaction were seen more frequently on the cleft side (75.0% and 35.7%, respectively) than on the normal side (57.1% and 14.3%, respectively) (p>0.05). • Compared to general populations, both cleft groups had greater rates of all dental abnormalities.
Alberto De Stefani et al	2019	Italy		There were 233 Italian patients in the racially homogeneous group of cleft patients (151	Nil	Patients with cleft lip and palate exhibit a greater frequency of hypodontia	The upper and lower second premolars and upper lateral

				males and 82 females). There were 1000 participants in the control group (529 females and 471 men).		than the overall healthy population. .	incisors were the most commonly absent teeth.

CL – cleft lip, UCLP- Unilateral cleft lip patients, BCLP- Bilateral cleft lip patients, OHRQoL-Oral health quality of life, MD- Mesiodistal, LL- Labiolingual, OG- Occlusogingival.

TABLE 4: PREVALENCE OF MALOCCLUSION AMONG CLEFT LIP AND CLEFT PALATE PATIENTS

MALOCCLUSIONS/ OCCLUSAL FINDINGS	NAME OF STUDY	SAMPLE SIZE	PREVALENCE
Congenital absence of lateral incisor	R. Rullo et al	90	40%
	Chiara Tortora, et al	87(UCLP)	48.8%
		29(BCLP)	6.1%
Missing permanent lateral incisor			45%
Hypodontia of lateral incisor	g. dewinter et al	75	50%
Supernumerary teeth at incisor region	R. Rullo et al	90	30%
	Chiara Tortora, et al	87(UCLP)	7.3%
Second premolar agensis	R. Rullo et al	90	4.4%
	Chiara Tortora, et al	87(UCLP)	4.9%
		29(BCLP)	1.2%
			25%
	g. dewinter et al	75	27.2%
Lateral or central incisor rotation	R. Rullo et al	90	31.1%
Intercanine and intermolar width in maxillary arch compared with normal class 1 malocclusion	Aiyesha Wahaj et al	64	P<0.001 in both inter canine and inter molar width
Intercanine and intermolar width in mandibular arch compared with normal class 1 malocclusion	Aiyesha Wahaj et al	64	P<0.001 only intercanine width
Cross bite	Anna Paradowska-Stolarz et al	154	Most commonly crossbite and class 3 malocclusion
Open bite			
Class 3 malocclusion			
microdontia	R. Rullo et al	31.1%	5.6%
Shape anomaly			25.6%
Enamel hypoplasia			18.9%
Maxillary and mandibular second premolar mesiodistal dimensions	M. Okan Akcam et al	BCLP	Maxillary right lateral incisor become smaller

		UCLP	Maxillary left lateral incisor become smaller
		BCLP and UCLP	maxillary and mandibular premolar followed by molar become larger
Labiolingual and occluso gingival level	M. Okan Akcam et al	UCLP	Smaller in both level
Canine impaction	Celikoglu M et al	28(UCLP)	75%
		22(BCLP)	35.7%
Tooth agensis		28(UCLP)	92.4%
		28(BCLP)	86.4%
malformations	g. dewinter et al	75	32%
Tooth agenesis	Alberto De Stefani et al	88	8.80%
Atleast one missing teeth	Alberto De Stefani et al	160	68.8%

Uclp- unilateral cleft lip patients, Bclp- bilateral cleft lip patients.

RESULTS:

1**. Prevalence of Congenital absence of lateral incisor**:
The study's findings revealed a 40% frequency with a sample size of 90. Research by Tortora Chiara et al. There were 87 participants in the sample, and the prevalence was 6.1% between those who have a unilateral cleft lip and palate (UCLP) and those who have a bilateral cleft lip and palate (BCLP), 48.8%. by R. Rullo and associates.

2. **Prevalence of Missing permanent lateral incisor**:
Research conducted by Chiara Tortora and colleagues: 87 participants with a 45% prevalence rate in people who have a cleft lip and palate that is unilateral (UCLP) and those who have a bilateral cleft lip and palate (BCLP).

3. **Prevalence of Hypodontia of lateral incisor**:
The study's findings by G. Dewinter et al. revealed a 50% frequency in a sample of 75 individuals.

4. **Prevalence of Supernumerary teeth at incisor region:**
R. Rullo et al. study: thirty percent prevalence with a sample size of ninety. Research by Chiara Tortora and colleagues: 87 participants with a 7.3% frequency of UCLP.

5. **Prevalence of Second premolar agenesis**:
The study showed a 4.4% prevalence with a sample size of 90. Research by Chiara Tortora and colleagues: 87 participants with a prevalence of 1.2% in people with BCLP and 4.9% in people with UCLP.Study by G. Dewinter et al.: R. Rullo et al. found a prevalence of 27.2% with a sample size of 75.

6. **Prevalence of Lateral or central incisor rotation**:
Research by R. Rullo et al.: 31.1% prevalence with a sample size of 90.

7. **Prevalence of Intercanine and intermolar width in maxillary arch**:
Aiyesha Wahaj et al.'s study included 64 participants and showed substantial deviations from the typical class 1 malocclusion.

8. **Prevalence of Intercanine and intermolar width in mandibular arch**:
The study conducted by Aiyesha Wahaj et al. included 64 participants and revealed considerable variations in intercanine width when compared to normal class 1 malocclusion.

9. **Prevalence of Crossbite**: Anna Paradowska-Stolarz et al.'s study revealed that class 3 malocclusion and crossbite were the most often occurring findings in a sample size of 154.

10. **Open bite prevalence**: 5.6% prevalence is linked to microdontia and class 3 malocclusion.

11. **Shape anomaly prevalence**: Research by R. Rullo et al.: 25.6% prevalence with a sample size of 31.1%.

12. **Enamel hypoplasia Prevalence**:
Research by R. Rullo and colleagues: 18.9% prevalence with a sample size of 31.1%.
13. Prevalence of Second Premolar Mesiodistal Dimensions:
The study's findings showed that people having a unilateral cleft palate and lip (UCLP) have smaller second premolar mesiodistal dimensions. This suggests that there is a particular dental abnormality associated with the size of the second premolars in people who have UCLP.

14. Maxillary Left Lateral Incisor Size Prevalence:
The study's findings demonstrated that those with unilateral and bilateral cleft lip and palate (BCLP and UCLP) have smaller maxillary left lateral incisors. This points to a prevalent pattern of smaller maxillary left lateral incisors in those with cleft lip and palate disorders.

15. Prevalence of Maxillary and Mandibular Premolars and Molar Dimensions: The study's findings revealed that the maxillary and mandibular premolars, then the molars, grow larger in people with BCLP and UCLP. This shows a particular pattern of tooth size variations in the molars and premolars of those who have disorders related to cleft lip and palate.

16. Labiolingual and occlusogingival prevalence:
The labiolingual and occlusogingival levels are reduced in both dimensions in those with UCLP. This implies that there may be variations in the labiolingual and occlusogingival levels of teeth between those who have UCLP and those who do not.

17. Canine Impaction Prevalence: Research indicates that 75% of people with UCLP and 35.7% of people with BCLP have canine impaction. This suggests that dogs with UCLP are more likely than dogs with BCLP to experience canine impaction.

18. Frequency according to Tooth Agenesis:
It has been shown that the prevalence of tooth agenesis is 92.4% in UCLP patients and 86.4% in BCLP patients. This highlights the prevalence of tooth agenesis in those with illnesses related to the cleft lip and palate.

19. Prevalence by Missing Teeth and Malformations:
The study shows that among the study samples, there was a prevalence of 68.8% for at least one missing tooth and 32% for malformations. This suggests that the groups under study have a notable prevalence of dental abnormalities and tooth loss.These results provide light on the distinctive features of the dental architecture of people with cleft lip and palate problems by elucidating the particular dental abnormalities and variations in tooth size seen in these individuals.
In the present Systematic Review study about 1265 papers were extracted in both national and international databases during the first data search. A total of 868 documents had been remained after the searching process after which duplicate materials were removed owing to overlapping databases. 224 studies were found to be irrelevant after screening on the basis of abstracts and titles. 35 cases were deemed irrelevant after a thorough examination of the 224 full text papers that remained. To verify the references, two papers were included. Three documents were eliminated after the articles quality was evaluated and the both inclusion and exclusion criteria were considered.

Review of the Individual studies:

In a study by R. Rullo et al. with 90 patients aged 12 to 18 years, the prevalence of congenital absence of lateral incisors in children ranged from 40% to 48.8% (UCLP) and 6.1% (BCLP) in a study by Chiara Tortorea et al. with 87 and 29 patients in the 10–12 age group.

According to a study by Chiara Tortola et al., the prevalence of missing permanent lateral incisors in children ranged from 45%.In a research by G. Dewinter et al., the prevalence of hypodontia of the lateral incisor in children ranged from 50% to 75% among 75 participants ages 12 to 18.The study conducted by R. Rullo et al. included 90 participants aged 11-18 years. The prevalence of supernumeraray teeth at the incisor region varied from 30% in the study to 4.4% in the study conducted by R. Rullo et al. with 90 participants.

The study conducted by Chiara Tortora et al. included 87 participants in the age group of 13-18 years. The study conducted by G. dewinter et al. with 75 participants showed a prevalence of 27.2%. and then, in a research by R. Rullo et al. with a sample size of 90, the prevalence of lateral or central incisor rotation in adults ranged from 31.1%.

Subsequent investigation showed that the prevalence of canine impaction and tooth agenesis varied from 75% (UCLP) to 35.7% (BCLP) and 92.4% (UCLP) to 86.4% (BCLP) and 8.80% in the study conducted by Celikoglu M et al and Dewinter with a sample size of 28 (UCLP), 22 (BCLP) and 28 (UCLP), 28(BCLP), 88. The prevalence of enamel hypoplasia, shape anomaly, and microdontia varied from 5.6%,25.6%,18.9% in the study conducted by R. Rullo et al. The prevalence of malformations and atleast one missing teeth varied from 8.80% and 68.8% in the study conducted by G.Dewinter et al and Alberto De Stefani et al with a sample size of 75 and 160.

The prevalence of intercanine and intermolar width in maxillary and mandibular arch with normal class 1 malocclusion shows that $p<0.001$ is both in maxillary arch and $p<0.001$ only intercanine width in mandibular arch conducted by Aiyesha Wahaj et al, and other malocclsuions like changes in labiolingual,occlusogingival,mesiodistal shows variations in other studies conducted by M.Okan akcam et al.

FIGURE-2: RISK OF BIAS ASSESMENT FOR INDIVIDUAL STUDIES

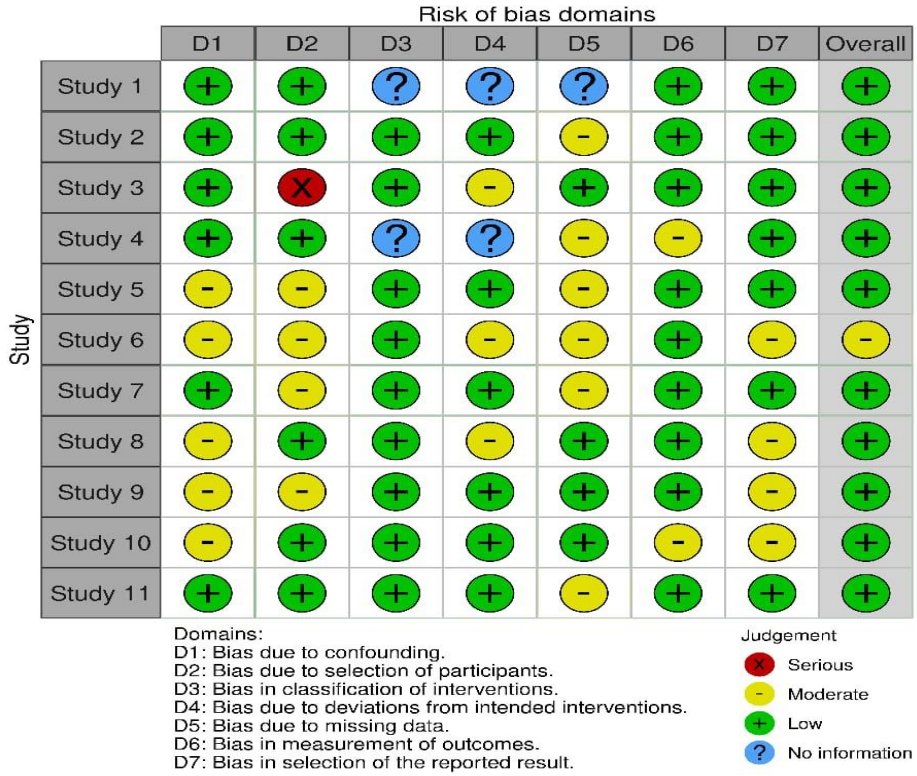
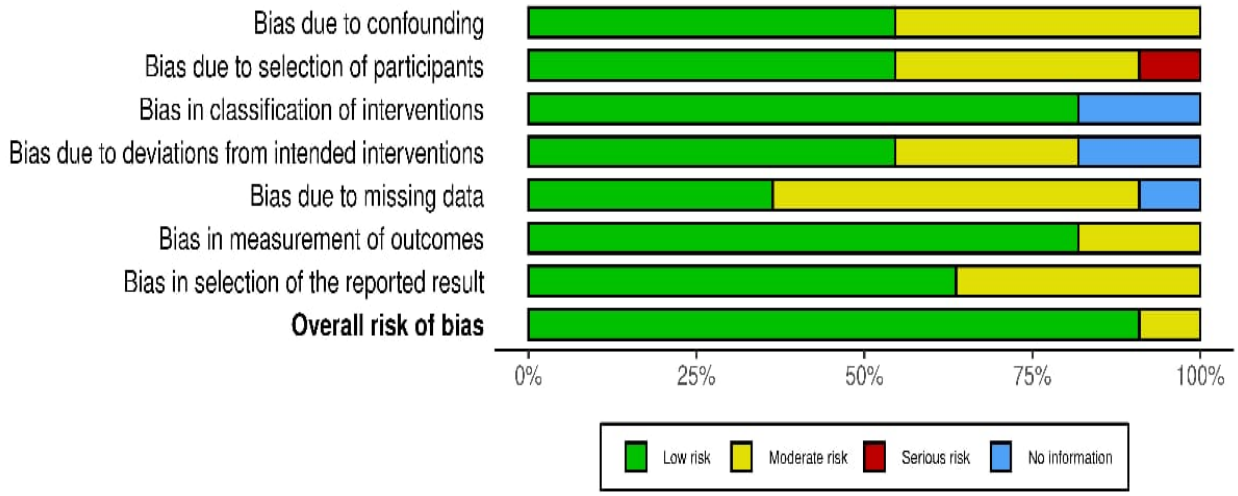


FIGURE 3: RISK OF BIAS FOR ALL INCLUDED STUDIES



DISCUSSION :

Oral clefts are a public health hazard that are brought on by abnormalities of the oral anatomy and related dental/occlusal disorders. A multidisciplinary team must regularly monitor speech, language, hearing, teeth, and ear infections in persons with an initial diagnosis of cleft lip from infancy until all care needs are met.In this study, predetermined standards developed from the random effects model were used to compare the results of previous investigations.

It was found that at least one type of dental malocclusion affects most adult individuals with cleft lip and palate. On the other hand, the frequency of agenesis of the second premolar, hypodontia of the lateral incisor, congenital absence of the lateral incisor, supernumerary teeth, agenesis of the lateral incisor, and other anomalies like intercanine and intermolar width, microdontia, and enamel hypoplasia was estimated to be 40%, 50%, 30%, 7.3%, 31.1%, 4.4%, and 4.9% of adult patients between the ages of 12 and 18 years, respectively.

Early life dental caries and poor feeding practices are associated with oral health problems in children with oral clefts and are commonly observed dental anomalies of people with a CLP (Mutarai et al., 2008). This high prevalence has been consistently reported in studies conducted on adults and children (Baek et al., 2002; Sakamoto et al., 2008; Vallino et al., 2008), with occlusal dysfunction concomitant with malocclusions present in 91% of children and 61% of adults with oral clefts (Vallino et al., 2008).

In another study, the prevalence of malocclusion according to Angle's classification was 91.8 percent for children aged 6 to 12 and 82.1 percent for adults over 13. Additionally, 61 percent of people have anterior crossbite as opposed to 57 percent, according to Sakamoto et al. (2008). Conversely, the percentage of posterior crossbite was higher (39 versus 9%). Vallino et al. (2008) reported that the most frequent occlusal anomaly seen was a crossbite.Even though there are a lot of limitations, they still need to be addressed. The malformation's consequences on a person's bones and teeth intensify when oral cleft patients do not obtain the necessary dental care, further endangering their psychological, functional, and cosmetic aspects.

FINAL RESULTS:

The study's findings suggest that because of their mouth clefts, patients with dentofacial anomalies need specific oral health care. Additionally, it was demonstrated that patients with distinct mouth clefts need different orthodontic interventions.

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