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Prevalence of malocclusion and its psychosocial impact among teenagers: A web-based survey

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Abstract:
Malocclusion among adolescents can affect dental appearance, self-confidence, and social wellbeing. Therefore, it is of interest to simulate the data from 620 adolescents aged 13–19 years to examine self-reported malocclusion and its psychosocial impact. Overall, 61.8% reported malocclusion, with dental crowding being the most common condition. Affected adolescents reported greater smile dissatisfaction, reduced self-confidence, and social embarrassment, while female sex and prior teasing were associated with perceived orthodontic treatment need. Thus, data shows the potential value of web-based surveys in identifying psychosocial concerns and guiding adolescent-focused orthodontic care.

Keywords: Malocclusion, adolescents, psychosocial impact, self-esteem, web-based survey, orthodontics

Background:
Malocclusion remains one of the most common orthodontic conditions encountered during childhood and adolescence, with approximately 70% of children and adolescents worldwide exhibiting some degree of malocclusion and 35-45% requiring formal orthodontic correction **[1].** Pooled estimates from Indian cohorts show that reported prevalence varies considerably, ranging from roughly 28% to 67% depending on the classification index applied, with a higher cumulative burden generally reported among boys **[2].** A large systematic review encompassing 123 studies further reported mean prevalence rates of 51.9%, 23.8% and 6.5% for Angle Class I, II and III malocclusion, respectively, underscoring substantial geographic and methodological variability in reported figures **[3].** Regional meta-analyses, such as one conducted among Turkish children and adolescents, have similarly identified dental crowding (41%) and increased overjet (34%) as among the most frequently observed occlusal irregularities in this age group **[4].** Beyond its functional and structural implications, malocclusion is increasingly recognised as a condition with substantial psychosocial consequences: irregular dental alignment during adolescence, a developmental period marked by heightened self-awareness and sensitivity to peer evaluation, has been linked to anxiety, diminished self-esteem and social withdrawal **[5].** Physical and dental appearance strongly influence interpersonal interaction and adolescents with visible malocclusion often report reduced self-worth and altered social relationships as a consequence **[6].** Given the sensitivity of appearance-related topics and the practical advantages of anonymity, reach and cost-effectiveness that digital data collection offers when surveying adolescents **[7],** web-based questionnaires have been increasingly adopted in oral health research involving this age group **[8]**. Therefore, it is of interest to evaluate the prevalence of self-reported malocclusion and its psychosocial consequences among adolescents using a structured web-based survey, illustrated here with a simulated dataset.

Materials and Methods:
Study design:
This educational example was designed as a fictional cross-sectional web-based survey using simulated participant responses for manuscript demonstration purposes.

Study population:
A total of 620 simulated adolescents aged 13–19 years were included.

Study duration: January 2026 to March 2026.

Inclusion criteria:
[1] Adolescents aged 13–19 years.
[2] Ability to understand English.
[3] Internet access.
[4] Willingness to participate.

Exclusion criteria*:*
[1] History of craniofacial syndromes.
[2] Previous orthognathic surgery.
[3] Incomplete questionnaires.

Sample size:
A fictional sample size of 620 participants was considered adequate to demonstrate statistical analysis.

Questionnaire:

The questionnaire contained four sections:
[1] Demographic information
[2] Self-reported occlusal characteristics
[3] Orthodontic treatment history
[4] Psychosocial impact of dental appearance
The psychosocial section consisted of 12 items rated using a five-point Likert scale ranging from strongly disagree to strongly agree.

Statistical analysis:
Data were analyzed using IBM SPSS Statistics Version 27.0. Descriptive statistics included frequencies, percentages, means and standard deviations. Associations between categorical variables were assessed using the Chi-square test. A p-value <0.05 was considered statistically significant.

Ethical approval:
As this manuscript uses a simulated dataset generated for demonstration purposes, no human participants were recruited and no institutional ethical approval was required. In an actual implementation of this survey design, approval would be sought from the appropriate institutional ethics committee and written informed assent and consent would be obtained from adolescent participants and their parents or guardians prior to participation, in accordance with the principles of the Declaration of Helsinki.

Results:
A total of 620 simulated responses were included in the final analysis. Participants ranged in age from 13 to 19 years, with a mean age of 16.2 ± 1.8 years. Females constituted 54.5% (n=338) of respondents, while 45.5% (n=282) were males. Most participants belonged to the 15–17 years age group (47.7%, n=296), followed by 13–14 years (27.4%, n=170) and 18-19 years (24.8%, n=154). Nearly three-fourths of respondents attended urban schools (71.0%, n=440), while 29.0% (n=180) were from rural schools **(Table 1).** Among the simulated participants, 383 (61.8%) reported having one or more forms of malocclusion, whereas 237 (38.2%) perceived their teeth to be normally aligned. Crowding was the most frequently reported occlusal problem (32.6%), followed by spacing (18.5%), increased overjet (14.7%), deep bite (11.9%), anterior open bite (6.5%) and crossbite (4.8%). Multiple occlusal problems were reported by 11.0% of participants **(Table 2).** Among respondents with perceived malocclusion, 58.5% (n=224) believed orthodontic treatment was necessary, while only 27.7% (n=106) had previously consulted an orthodontist. Fixed orthodontic treatment had been received by 18.3% (n=70) of participants with malocclusion **(Table 3).** Participants with self-reported malocclusion demonstrated substantially greater psychosocial concern than those without malocclusion. Among affected participants, 65.3% reported dissatisfaction with their smile, 56.7% avoided smiling in photographs, 48.8% experienced embarrassment during social interactions and 39.9% reported reduced confidence while speaking in public **(Table 4).** A statistically significant association was observed between perceived malocclusion and reduced self-confidence ($\chi^2 = 31.42$; $p < 0.001$). Teenagers reporting malocclusion were considerably more likely to express dissatisfaction with their dental appearance and confidence **(Table 5).** Female participants reported significantly greater dissatisfaction with dental appearance than males ($\chi^2 = 12.76$; $p = 0.001$) **(Table 6).** Participants who were dissatisfied with their smile were significantly more likely to perceive a need for orthodontic treatment (OR = 3.41; 95% CI: 2.30–5.05; $p < 0.001$). Reduced self-confidence (OR = 2.84; 95% CI: 1.88–4.27) and previous teasing due to dental appearance (OR = 2.12; 95% CI: 1.28–3.52) were similarly significant predictors of perceived treatment demand **(Table 7).** Overall, the simulated prevalence of self-reported malocclusion among teenagers was 61.8%, with crowding the most frequently perceived occlusal abnormality. Adolescents with malocclusion reported significantly greater dissatisfaction with dental appearance, reduced self-confidence, avoidance of smiling in photographs and increased social embarrassment. Female participants exhibited higher levels of smile dissatisfaction than males and perceived treatment need was strongly associated with psychosocial distress.

Table 1: Demographic characteristics of participants (n=620)

Variable	Frequency (n)	Percentage (%)
Age 13–14 years	170	27.4
Age 15–17 years	296	47.7
Age 18–19 years	154	24.8
Male	282	45.5
Female	338	54.5
Urban residence	440	71
Rural residence	180	29

Table 2: Distribution of self-reported malocclusion (n=620)*

Type of Malocclusion	n	%
Crowding	202	32.6
Spacing	115	18.5
Increased overjet	91	14.7
Deep bite	74	11.9
Open bite	40	6.5
Crossbite	30	4.8
Multiple abnormalities	68	11

**Participants could report more than one condition.*

Table 3: Orthodontic awareness and treatment history (n=383)

Variable	n	%
Felt treatment was required	224	58.5
Consulted an orthodontist	106	27.7
Underwent orthodontic treatment	70	18.3
Never consulted	277	72.3

Table 4: Psychosocial responses among participants with malocclusion (n=383)

Psychosocial Variable	n	%
Dissatisfied with smile	250	65.3
Avoid smiling in photographs	217	56.7
Feel embarrassed about teeth	187	48.8
Reduced self-confidence	153	39.9
Experienced teasing/bullying	88	23
Avoid social gatherings	79	20.6

Table 5: Associations between malocclusion and self-confidence

Self-confidence	Malocclusion Present (n=383)	No Malocclusion (n=237)	p-value
Reduced	153 (39.9%)	35 (14.8%)	<0.001
Normal	230 (60.1%)	202 (85.2%)	—

Table 6: Smile dissatisfaction according to gender

Gender	Dissatisfied	Not Dissatisfied	p-value
Male (n=282)	97 (34.4%)	185 (65.6%)	–
Female (n=338)	153 (45.3%)	185 (54.7%)	0.001

Table 7: Logistic regression analyses – predictors of perceived orthodontic treatment need

Variable	Odds Ratio	95% CI	p-value
Smile dissatisfaction	3.41	2.30–5.05	<0.001
Reduced self-confidence	2.84	1.88–4.27	<0.001
Previous teasing	2.12	1.28–3.52	0.003

Discussion:

The present findings, generated using a simulated dataset for demonstration purposes, indicated an overall prevalence of self-reported malocclusion of 61.8% among the study population, a figure that falls within the wide range previously reported in systematic reviews and meta-analyses of adolescent populations**.** Dental crowding emerged as the most frequently reported occlusal abnormality in the simulated sample, a pattern consistent with regional meta-analytic data identifying crowding as one of the most prevalent orthodontic features among adolescents **[9].** The considerable smile dissatisfaction and social embarrassment associated with self-perceived malocclusion observed in this dataset mirror earlier work showing that dental appearance meaningfully affects oral health related quality of life and psychosocial wellbeing across multiple domains, including dental self-confidence, psychological impact and social interaction **[10].** Similarly, the marked reduction in self-confidence observed among participants reporting malocclusion is consistent with prior findings linking low self-esteem to negative self-perception of dental aesthetics **[10]** and with reports that adolescents with pronounced occlusal irregularities experience greater psychological and social impact than their unaffected peers **[11].** The gender difference observed in this dataset, with female participants reporting significantly greater smile dissatisfaction than males, aligns with a substantial body of literature indicating that female adolescents tend to attach greater importance to dental and facial aesthetics and consistently report higher psychosocial impact scores than males **[12].** The association between smile dissatisfaction, reduced self-confidence, previous teasing and perceived orthodontic treatment need observed in the logistic regression analysis is likewise consistent with prior multivariate analyses showing that self-esteem and psychosocial distress are significant predictors of subjective orthodontic treatment demand **[12, 13].** Taken together, these illustrative findings reinforce existing evidence that malocclusion during adolescence extends beyond a purely dental or functional concern to meaningfully affect emotional wellbeing, body image and social confidence, supporting the case for early screening and appropriately timed orthodontic intervention accompanied by psychosocial support where indicated **[14, 15]**. It should be emphasised that the dataset used in this manuscript was simulated for demonstration purposes and does not represent findings from an actual survey; consequently, these results should not be interpreted as real epidemiological evidence and any future implementation of this survey design should be validated using genuinely collected participant data.

Conclusion:

Malocclusion may be associated with reduced self-confidence, smile dissatisfaction and social embarrassment among adolescents. Routine screening should consider both dental irregularities and their potential psychosocial impact, with orthodontic referral when indicated. As the dataset is simulated, these findings are illustrative and require validation through genuine data collection.

References:

[1] Göranson E *et al. Eur J Orthod*. 2023 **45**:295. [PMID: 36995692]
[2] Mehta A *et al. Int J Adolesc Med Health.* 2020 **34**:371. [PMID: 32829315]
[3] De Ridder L *et al. Int J Environ Res Public Health.* 2022 **19**:7446. [PMID: 35742703]
[4] Londono J *et al. Clin Exp Dent Res.* 2023 **9**:689. [PMID: 37574975]
[5] Patri V *et al. Cureus.* 2025 **17**:e82658. [PMID: 40400851]
[6] Taibah SM & Al-Hummayani FM. *J Orthod Sci.* 2017 **6**:123. [PMID: 29119092].
[7] Parker JN *et al. JMIR Form Res.* 2024 **8**:e56788. [PMID: 39651967].
[8] Maharani DA *et al. BMC Oral Health.* 2021 **21**:22. [PMID: 33413315]
[9] de Paula Júnior DF *et al. Angle Orthod*. 2009 **79**:1188. [PMID: 19852614]
[10] Sicari F *et al. Children (Basel).* 2023 **10**:1691. [PMID: 37892353]
[11] Akpasa IO *et al. J World Fed Orthod*. 2022 **11**:120. [PMID: 35672244]
[12] Muniz Júnior AB *et al. Pesqui Bras Odontopediatria Clín Integr.* 2022 **22**:e200178.[DOI: 10.1590/pboci.2022.081]
[13] Ben Gassem AA *et al. Eur J Dent.* 2023 **17**:713. [PMID: 36075263]
[14] Balachandran P & Janakiram C. *J Oral Biol Craniofac Res*. 2021 **11**:192. [PMID: 33659178]
[15] Alogaibi YA *et al. J Orthod Sci.* 2020 **9**:3. [PMID: 32166082]

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