

The Classification of Lower Third Molar Impaction and Relationship to Sociodemographics

Komang Krisna Dewi¹, Ihsan Firdaus²

¹Department of Biology Oral, Faculty of Dentistry, Universitas Prof. Dr. Moestopo (Beragama), Jakarta, Indonesia

²Department of Conservative Dentistry, Faculty of Dentistry, Universitas Prof. Dr. Moestopo (Beragama), Jakarta, Indonesia

ABSTRACT

ARTICLE DETAILS

Background: Impacted teeth occur due to eruption failure caused by a lack of space in the dental arch or obstruction by surrounding tissues. Clinical complaints vary depending on the angulation, depth, and relationship with the second molar based on the Pell & Gregory and Winter classifications. In addition to clinical aspects for determining diagnosis and treatment, analyzing patient sociodemographic data is essential as it can influence clinical considerations, healthcare administration, and the patient's quality of life.

Objective: A Classification of Lower Third Molar Impaction and Its Relationship to Sociodemographic Factors

Methods: This descriptive-analytical study used secondary data from medical records and panoramic X-rays of patients at dental practices in the Jakarta area. The sampling technique used was purposive sampling based on inclusion criteria, including sociodemographic characteristics (age, gender, education, occupation) and impaction classification.

Results: The highest prevalence of lower third molar impaction cases is consistently associated with the following characteristics: female gender, age 23, a bachelor's degree (S1), and student status. Across all sociodemographic groups, the most frequently observed anatomical impaction characteristic is Class II, Position A, with a mesioangular angle.

Conclusion: There is an indirect association between the classification of lower wisdom tooth impaction and patients' sociodemographic characteristics (gender, age, education level, and occupation). Diet, lifestyle, the critical period of wisdom tooth eruption, health awareness, financial independence, and access to health care are factors that influence the frequency of dental visits among patients with impacted teeth.

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KEYWORDS: Impacted teeth, Tooth Impaction Classification, Patient Sociodemographics.

INTRODUCTION

Tooth impaction refers to the failure of a tooth to erupt into its normal functional position due to a lack of space in the dental arch or obstruction by surrounding tissues, with the mandibular third molar being the most frequently affected element. (1,2) Physiologically, these teeth erupt between the ages of 16 and 24 years. (3) Mandibular third molar impaction can trigger various oral pathological complications, including orofacial pain, pericoronitis, abscesses, bone loss, occlusal disturbances, cysts,

and odontogenic tumors. Furthermore, these impactions often cause masticatory dysfunction, which significantly reduces patient comfort. (4-6)

The manifestation and severity of these symptoms vary widely, influenced by anatomical variations such as depth, angulation of the impacted tooth, and its relationship with the second molar based on the Pell & Gregory and Winter classifications. An abnormal position of the lower third molar can create an anatomical gap (*food retention area*) with the adjacent second

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molar. The accumulation of food debris in this hard-to-clean area leads to bacterial decomposition, triggering dental caries that eventually progress to sensitivity or even pulpitis. (2,7,8) In addition to caries, the mechanical pressure exerted by the impacted tooth can induce external root resorption on the second molar due to the loss of the cementoblast layer, which exposes the demineralized root surface. This resorption process is generally asymptomatic and is often detected late by patients. (2,7,8) An epidemiological study by Arisetiadi et al (2017) demonstrated that cases of second molar caries resulting from third molar impaction were most predominantly found in males aged between 21 and 22 years. (8) Patient sociodemographics, which include age, sex, and ethnicity, influence jaw growth and genetic factors. Education, occupation, or income affect the patient's decision-making regarding treatment, which in turn influences the clinician's considerations in determining the management of the impacted teeth. (9-12)

Therefore, a comprehensive understanding of the anatomical classifications of impacted teeth and their impact on surrounding tissues is crucial for dentists to establish effective patient communication, education, and proper clinical treatment decisions.

MATERIALS AND METHODS

This study evaluated the relationship between patient sociodemographic characteristics as the independent variable and the classification of mandibular third molar impaction as the dependent variable. Purposive sampling was used, with the researcher selecting respondents and samples based on specific criteria relevant to the research objectives. Data Collection and Instruments. This descriptive-analytical study used secondary data from medical records and panoramic X-rays of patients at dental practices in the Jakarta area. The sampling technique used was purposive sampling based on inclusion criteria, including sociodemographic characteristics (age, gender, education, occupation) and impaction classification. Data were gathered using two primary instruments:

1. Patient Sociodemographic Data: Collected from the medical records of oral surgery patients, including age, gender, ethnicity, education level, occupation, and economic status or income.
2. Impaction Classification: Determined radiographically using panoramic radiographs based on the criteria of the Pell-Gregory classification and the Winter classification. Measurement Procedures The clinical characteristics of the impaction were evaluated on the radiographs using three main parameters: (13,14)
1. Occlusal Depth (Pell-Gregory Position): Determined based on the relationship of the highest point of the third molar to the occlusal plane and the cervical line of the adjacent

second molar, categorized as follows:

- a. *Position A*: The highest point of the third molar is higher than or level with the occlusal plane of the second molar.
 - b. *Position B*: The highest point of the third molar is located between the occlusal plane and the cervical line of the second molar.
 - c. *Position C*: The highest point of the third molar is below the cervical line of the second molar.
2. Space Availability (Pell-Gregory Class): Determined based on the ratio of the mesiodistal diameter of the impacted tooth to the space available between the distal surface of the second molar and the *ramus ascendens* of the mandible, categorized as follows:
 - a. *Class I*: Sufficient space is available between the distal surface of the second molar and the mandibular *ramus* to accommodate the mesiodistal width of the third molar.
 - b. *Class II*: The space between the distal surface of the second molar and the mandibular *ramus* is smaller than the mesiodistal width of the third molar.
 - c. *Class III*: All or most of the third molar is located within the mandibular *ramus*, leaving no space available.
 3. Direction of Tooth Inclination (Winter Angulation): Determined based on the angle formed between the long axis of the impacted third molar and the long axis of the adjacent second molar, generally grouped as follows:
 - a. *Mesioangular*: The long axis of the third molar is inclined anteriorly (towards the second molar).
 - b. *Horizontal*: The long axis of the third molar is perpendicular or horizontal relative to the second molar.
 - c. *Vertical*: The long axis of the third molar is parallel to the long axis of the second molar (but failed to erupt due to bone or mucosal coverage).
 - d. *Distoangular*: The long axis of the third molar is inclined posteriorly (away from the second molar).

RESEARCH RESULTS

Based on the inclusion criteria, a total of 140 study subjects with complete medical records and valid panoramic radiographs were selected for analysis. The distribution of subjects' sociodemographic characteristics by sex and age is presented in detail in Table 1.

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Table 1. Distribution of Sociodemographic Characteristics of Subjects with Impacted Lower Third Molars (n = 140)

Sociodemographic Characteristics	Category	Number (n)	Percentage (%)
Gender	Male	67	47,86
	Female	73	52,14
	Total	140	100.0
Age	17	1	0,71
	18	7	5,00
	19	1	0,71
	20	6	4,29
	21	15	10,71
	22	11	7,86
	23	22	15,71
	24	4	2,86
	25	3	2,14
	26	7	5,00
	27	6	4,29
	28	4	2,86
	29	5	3,57
	30	3	2,14
	31	4	2,86
	32	3	2,14
	33	4	2,86
	34	0	0
	35	4	2,86
	36	7	5,00
	37	4	2,86
	38	4	2,86
	39	1	0,71
	40	7	5,00
	41	0	0
	42	0	0
	43	0	0
	44	7	5,00
	Total	140	100.0
Education	Junior High School	5	3,57
	High School	12	8,57
	Bachelor Degree 1	119	85,00
	Bachelor Degree 1	4	2,86
	Total	140	100.0
Occupation	Employee	39	27,86
	Entrepreneur	17	12,14
	Teacher	2	1,43
	Nurse	1	0,71
	Housewife	21	15,00
	Domestic Helper	5	3,57
	Online Motorcycles	2	1,43
	Driver	1	0,71

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College	49	35,00
Student	3	2,15
Total	140	100.0

Table 1 shows that out of a total of 140 subjects, cases of impacted mandibular third molars were more common in women, accounting for 73 (52.14%). Meanwhile, by age group, the highest prevalence of impaction cases was among 23-year-olds, accounting for 22 (15.71%), followed by 21-year-olds, with 15 (10.71%). In terms of educational status, subjects with a Bachelor's degree (S1 or S2) dominated, accounting for 119 (85%) of the 140 patients. Based on the subjects' occupations, students were more likely to seek treatment for impacted mandibular third molars, accounting for 49 (35.00%), followed by employees (39 (27.86%), and housewives 21 (15.00%).

Table 2. Relationship between Classification Characteristics of Impacted Lower Third Molars and Patient Gender (n = 140)

Clinical Characteristics of Impaction	Gender		Total n (%)
	Male n (%)	Female n (%)	
Occlusal Depth (Pell & Gregory)			
Position A	55 (39,29%)	54 (38,57%)	109 (77,86%)
Position B	9 (6,43%)	16 (11,43%)	25 (17,86%)
Position C	3 (2,14%)	3 (2,14%)	6 (4,28%)
Space Availability (Pell & Gregory)			
Class I	16 (11,43%)	15 (10,71%)	31 (22,14%)
Class II	50 (35,71%)	58 (41,43%)	108 (77,14%)
Class III	1 (0,71%)	0 (0,00%)	1 (0,71%)
Direction of Tooth Inclination (Winter Angulation)			
Vertical	20 (14,29%)	13 (9,29%)	33 (23,57%)
Horizontal	15 (10,71%)	15 (10,71%)	30 (21,43%)
Mesioangular	32 (22,86%)	45 (32,14%)	77 (55,00%)
Treatment Difficulty Level			
Easy	31 (22,14%)	39 (27,86%)	70 (50,00%)
Moderate	32 (22,86%)	30 (21,43%)	62 (44,30%)
Difficult	4 (2,86%)	4 (2,86%)	8 (5,70%)

Based on the cross-analysis in Table 2, the distribution of impaction classifications tends to be consistent across patient sociodemographic variables. In the most affected productive age group, those aged 23 years (15.71%), all cases (100%) were centrally diagnosed as having the clinical characteristics of Class II, Position A, with a mesioangular inclination. This similar impaction pattern (Class II, Position A, mesioangular) was also consistently found in the group of patients with a bachelor's degree (S1) and those with a student occupation. Overall, anatomical characteristics such as moderate space limitation (Class II) and high occlusal position (Position A) were the most frequent local manifestations prompting this productive age group to seek radiographic examination.

DISCUSSION

Based on a study examining the classification of lower third

molar impaction and its relationship to patient sociodemographic characteristics, it was found that female subjects experienced lower third molar impaction more frequently than males. Although the difference between the two groups was not statistically significant in this study, it is known that the prevalence of lower third molar impaction is higher in females than in males. This is related to the growth and anatomical development of the female jaw, which tends to stop earlier, often leaving insufficient space for the third molars to erupt. (8,15,16) Differences in growth rates between males and females affect the size of the dental arch. (17) The menstrual cycle and physical activity can cause the jawbone in females to mature more rapidly and become denser, potentially leading to obstruction at the site of third molar eruption and resulting in tooth impaction. (18) Insufficient space for third molar eruption may also be influenced by an imbalance in the growth process

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of the mandibular ramus, associated with bone resorption in the anterior region and bone deposition on the posterior surface. (19) Similar findings were reported in a study by Fitri et al (2016), which indicated that the prevalence of third molar impaction was only 20% in the male sample, while the remaining 80% were female. (16) A study by Septina et al (2021) also showed that the distribution of lower third molar impaction cases at Brawijaya University Teaching Hospital, based on gender, was 65 (67.1%) in females and 32 (32.9%) in males. (1) This indicates that cases of lower third molar impaction are more common in women. Christian et al. (2025) reported in their study that the distribution of lower third molar impaction cases by gender showed similar percentages between men (49.65%) and women (50.35%). (20) This suggests that third molar impaction is related to an individual's jaw growth; specifically, women experience a halt in growth at the time of third molar eruption, whereas men are still growing during third molar eruption and are therefore able to provide sufficient space for the third molar. (16)

The prevalence of lower third molar impaction based on patient age in this study, which covered the age range of 17–44 years, shows that patients seeking treatment for lower third molar impaction at the dentist were most common at age 23, followed by those aged 21 and 22. Lower third molars normally begin to erupt between the ages of 16 and 24. (3) At that age, the crown of the third molar is fully formed and begins to erupt. The roots of third molars are not fully formed until around age 25 or older; however, in many cases, they are often impacted due to a lack of space for eruption. (18,21) Christian et al. (2025) reported in their study that, when examining the distribution of third molar impaction cases by age group, the highest prevalence was found in the 26–35 age group (86.11%), followed by the 18–25 age group (81.81%), 36–45 age group (72.09%), 46–55 age group (66.67%),

56–65 age group (36.11%), and those over 65 years of age (24.32%). (20) Based on the analysis of this study, many patients only become aware that their third molars are impacted in adulthood, around the ages of 30–40 or older, when the impacted teeth have already caused symptoms and complications such as recurrent pain and swelling, dental caries, and in some cases mesioangular and horizontal impaction, which causes the front teeth to be pushed forward and results in a misaligned or irregular dental arch.

A descriptive analysis of 140 subjects with lower third molar impaction who sought treatment from a dentist revealed that the highest level of education was a Bachelor's degree (S1). The occupational distribution in this study showed that the "Employee" group ranked first, followed by "College Students" and "Housewives." The majority of patients with lower third molar impaction in this study had a higher education background, either currently pursuing a Bachelor's degree or

having already completed one. Undergraduate students currently pursuing their degrees, aged 18–25 years, were in the eruption phase. From an epidemiological perspective, these individuals experienced a higher prevalence of active symptoms due to impaction, such as chronic pain, gum swelling, or difficulty chewing. Patients with a bachelor's degree have a better understanding of the importance of early medical intervention, specifically through odontectomy for teeth diagnosed with impaction. This group has broader access to digital health information, so they tend to seek treatment immediately at secondary or tertiary healthcare facilities (dental hospitals or general hospitals) rather than delaying care or attempting self-treatment. Patients with higher levels of education such as those holding a diploma or bachelor's degree generally have better knowledge of oral health. They are quicker to recognize abnormal symptoms such as lower jaw pain, swollen gums, or headaches. Highly educated individuals are more likely to undergo routine checkups or seek immediate medical attention when their third molars begin to grow crooked, so the referral rate for detected cases in this group is often high at hospitals or clinics. (9,11,16,20)

Among employees, financial stability and insurance coverage tend to be more adequate. Treatment for impacted teeth involves relatively high costs and requires additional diagnostic tests such as panoramic X-rays. Patients who are employed—particularly those in the private sector, as civil servants, or as professionals, typically have sufficient financial resources or health insurance benefits to cover these costs. Treatment costs are generally covered by health insurance (BPJS Kesehatan or private employer-sponsored insurance), thereby minimizing financial barriers to seeking care. Pain caused by impacted teeth can interfere with concentration and work performance, leading to absenteeism. Employees tend to opt for definitive treatment (extraction). Therefore, the working population is more motivated to have impacted teeth extracted to avoid a decline in productivity. (14,20)

From a medical perspective and based on various epidemiological studies in dentistry, the following are important facts regarding the prevalence or incidence of third molar impaction, broken down by patient age. The highest prevalence of lower third molar impaction is found in the 20–29 age group. This is because this age range is the normal period during which third molars should have completed eruption. When there is insufficient space in the lower dental arch, these teeth become impacted or grow at an angle. Early detection typically occurs in late adolescence (ages 16–19). Cases of impaction generally begin to be detected through clinical examinations or panoramic X-rays starting in late adolescence. At this age, the roots of the third molars are in the process of fully forming. The incidence of complaints decreases in older age (over 40 years). The prevalence of patients visiting the dentist with acute complaints

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due to impacted teeth tends to decrease with age. This is due to increased jawbone density or because problematic teeth are generally extracted at a young age. (22) Indra et al (2024) state that variations in the incidence of impacted wisdom teeth are associated with several demographic factors. (23)

Based on the Pell and Gregory classification of impaction, it was concluded that the distribution of M3 RB impaction classifications was highest in Position A and mesioangular in both male and female patients, with the results being evenly distributed. Female patients showed a tendency to have more cases of Class II and Position B than males, whilst vertical angulation was more commonly found in males. The high frequency of third molar impaction in women is due to differences in the growth period between men at the age of 21, and women at the age of 18 where as women's growth typically ceases just as the third molars begin to erupt. In contrast, in males, jaw growth continues throughout the eruption phase of the third molars, thereby providing more space for their eruption. In addition, several contributing factors such as the pressure exerted during chewing, the form of food, and the proportions of the teeth and jaws tend to be larger in men than in women, which will subsequently influence the growth and development of the jaw. (1,22)

Based on the classification of lower third molar impaction in patients aged between 17 and 44 years, the research data show that the age of 23 recorded the highest number of M3 RB impaction cases, specifically in Class II, Position A and mesioangular angulation. The next highest numbers were found in patients aged 21 and 22 years. Given the wide age distribution of impaction cases in this study, the high incidence among 21–22-year-olds can be explained by the fact that, chronologically in human dental development, the M3 is the last tooth to erupt.

The normal eruption period for this tooth is between the ages of 17 and 25, which is why it is often referred to as a wisdom tooth. (18,24) In cases of impaction in those under 20 years of age, the M3 tooth is mostly still within the jawbone and is attempting to erupt upwards. Between the ages of 21 and 23, the crown of the M3 tooth has reached its maximum point of penetration through the gums. At this age, root formation is nearly complete at around two-thirds to full development there by providing strong propulsive force for the tooth to emerge. If there is insufficient space, the tooth will begin to collide with the tooth in front of it or become trapped beneath the gums, leading to impaction. Patients begin to experience various symptoms and complaints as a result of this condition, which is why many only visit the dentist for treatment at this age. (10, 13, 18, 24, 25) Indra et al. (2024) state that variations in the incidence of impacted wisdom teeth are associated with several demographic factors. (23) Based on the occupational demographic data of the study subjects, the Bachelor's degree

(S1) group had a high incidence of Class II, Position A and mesioangular impaction, followed by the General Secondary School (SMU) group. The absolute dominance of the Bachelor's degree group reflects a population with sufficient awareness, time and access to visit a dentist to address complaints of impacted teeth. In Position A, the tooth is situated very close to the gum surface or has even partially erupted. This condition makes the surrounding gum crevice highly susceptible to food debris becoming trapped, yet difficult to clean. Consequently, this triggers gum inflammation (pericoronitis) or tooth decay (caries). As it is painful, patients eventually visit a dentist for an examination and to undergo an odontectomy. Position C impaction, where the tooth is deeply embedded within the bone, is often asymptomatic, so it is rarely noticed by the patient unless detected incidentally on an X-ray. (8) The relationship between a person's level of education and the occurrence of lower third molar (M3 RB) impaction is not, in fact, one of causality or a direct biological cause-and-effect relationship. Education does not cause teeth to become impacted, but a person's level of education determines how aware they are and how quickly they will seek to see a dentist for surgical treatment when the impacted tooth begins to cause problems.

Based on the analysis of the research data, students accounted for the majority of cases of impacted mandibular third molars (M3 RB) seeking treatment from a dentist. The predominant type of impaction observed was Class II, Position A and mesioangular. The second most common group was that of office staff or employees. This is supported by the study by Shaari et al. (2023), cited from the research by Indra et al. (2024), which states that Class II is the most common classification found in mandibular third molar impaction. (23) University students and employees constitute demographic groups at the peak age for the development of wisdom tooth complications; they tend to have narrow jaws due to modern diets consisting largely of soft foods, experience activity-related stress requiring immediate pain management, and have access to stable financial resources or health insurance. It is this combination of factors that makes them the most common group of patients in dental practices seeking surgical treatment. Students are in the 18–23 age range, an active period during which the third molars (M3) are attempting to erupt through the gums as their root formation has reached its peak. As growth of the lower jaw generally ceases by the age of 20–21, the pressure from these teeth encounters limited space, triggering severe pain such as gingivitis or pericoronitis. Employees are generally aged 23 and over. At this stage, the tooth has failed to erupt fully; by the time they enter university, the impaction begins to cause symptoms and further complications, such as tooth decay resulting from the long-term accumulation of food debris in the impacted area.

Modern urban students and employees have a very close

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association with diets consisting of processed foods, fast food, and the trend of consuming trendy snacks and drinks that are soft in texture and high in carbohydrates. A lack of consumption of natural, hard or high-fibre foods—which require strong chewing power—from childhood onwards means that the masticatory muscles are not adequately stimulated. Pain caused by impacted teeth is not limited to localised pain in the gums, but often triggers one-sided headaches (migraines), jaw stiffness (trismus), and even fever. Pain from impacted teeth significantly disrupts students' ability to concentrate on their studies, exams, or coursework. For employees, the pain reduces concentration at work and professionalism, and may even force them to take sick leave. High levels of stress amongst students (academic pressure) and employees (work pressure/deadlines) can weaken the body's immune system. This weakened immune response allows bacteria around the gum folds of the impacted tooth to multiply more rapidly, causing an acute gum infection (pericoronitis) – which had previously been dormant – to suddenly flare up and become extremely painful. It is this that compels them to seek immediate dental treatment. (3,18,20,23)

Based on the classification of M3RB impaction and its relationship with the patients socio-demographic characteristics namely gender, age, education and occupation, it is possible to determine the most common level of difficulty encountered in the M3RB impaction case data from this study. Of the 140 cases of M3RB impaction, the highest number of easy cases were found among females, with the majority aged 23 years, holding a Bachelor's degree (S1) and employed as students. Based on the data, it can be analysed that the distribution of surgical difficulty levels between the two genders is relatively similar, although it is more pronounced in women. Although M3 RB impaction cases with an easy difficulty level were frequently found in 23 year olds, difficult cases were also found in younger age groups, namely 18 and 23 years old, and in older age groups, namely 37 and 40 years old. It can therefore be concluded that the local anatomical factors relating to the position of the tooth are a more decisive factor in determining the complexity of the surgery than the patient's advancing biological age. The classification of lower third molar impaction determines the complexity of the surgical procedure, which can be ascertained from an analysis of the degree of impaction. Extraction procedures on lower third molars with specific depths and positions can lead to various complications, including paraesthesia resulting from trauma to the mandibular canal, which is situated close to the apical region of the impacted third molar, as reported by Krisna Dewi K, et al (2017) consequently, careful consideration, effective communication and thorough patient education are essential. (6)

In this study, no Chi-square statistical tests were performed between variables. The study provides a description of the classification of third molar impaction in the lower jaw and

relates this to the patients' sociodemographic characteristics. To perform a Chi-square test between sociodemographic variables (Age, Gender, Education, Occupation) and the classification of lower third molar impaction (Class, Position, Angulation, Degree of Difficulty), one must observe an important rule in statistics: no cell may have an expected count of less than 5 in more than 20 per cent of all cells. If the Age variable is broken down individually such as 17, 18, 19, etc. or if the Occupation variable has too many small categories, such as domestic helper, driver or nurse, for which there is only one sample, the contingency table will become too large and contain many empty values (zero or one). This renders the Chi-Square test invalid. However, to obtain a clear picture of the patients' classifications and socio-demographic relationships, the research results were analysed based on the complete dataset.

Based on the research analysis outlined above, it is evident that the classification of lower third molar impaction varies considerably in terms of depth, angulation and the availability of space. These conditions are influenced by biological factors, craniofacial (facial bone) growth, the size of the dental arch, and the size of the tooth crown, which are genetically determined, rather than by the patient's social status, gender, or daily activities (occupation). However, in epidemiological and social dentistry studies, there is a very strong indirect link between third molar impaction and lifestyle and dietary patterns in modern society, which can lead to suboptimal jaw growth and a potential for impaction. The classification of third molar impaction is closely related to the symptoms or complaints experienced by the patient. Teeth that are erupting tend to cause numerous complaints experienced by patients, particularly during the eruption of third molars. Patients' education and occupation indirectly influence this condition. Students and employees constitute a demographic group at the peak age for the development of wisdom tooth complications; they tend to have narrow jaws due to modern dietary habits, experience the pressures of a demanding lifestyle that necessitates immediate pain management, and have access to stable financial resources or health insurance. It is this combination of factors that makes them the most prevalent patient group in dental practices seeking odontectomy treatment. Clinical knowledge and health awareness regarding the symptoms and consequences of impaction influence how promptly patients seek dental care. Consequently, patients with Class I and II impaction classifications, positions A and B, and mesioangular and horizontal angulation, aged between 21 and 23 years (the productive age group), and possessing high levels of clinical knowledge and awareness, as identified in this study, demonstrate that there is an indirect relationship between the classification of impaction and the patients' sociodemographic characteristics.

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CONCLUSION

There is an indirect association between the classification of lower wisdom tooth impaction and the patients' sociodemographic characteristics (gender, age, educational level and occupation). Diet, lifestyle, the critical period of wisdom tooth eruption, health awareness, financial independence and access to healthcare are factors that influence the frequency of visits to the dentist amongst patients with impacted teeth.

RECOMMENDATIONS

1. Given that the peak incidence and patient visits occur within the productive age range (21–23 years), dentists are advised to provide education and carry out preventive examinations, such as recommending panoramic X-rays for late adolescents aged 17–19 years before the roots of the third molars (M3) are fully formed and cause painful complications (pericoronitis).
2. The scope and accessibility of health insurance (BPJS) and private health insurance should be expanded to cover third molar impaction cases, as this treatment has proven to be a crucial necessity for the working-age population; the high cost of surgery often leads patients to delay treatment, resulting in complex problems later on.
3. Future research should conduct more in-depth inferential statistical tests. In this study, the data were analysed using cross-tabulation. It is recommended that future researchers conduct formal hypothesis tests, such as the Chi-Square test or Fisher's Exact Test, to determine whether the relationship between these socio-demographic variables is statistically significant. This could not be done with the data in this study due to the presence of extreme and dominant data points. Future research is advised to use the stratified random sampling method to ensure a more even distribution of educational levels and occupational types, thereby making the generalisation of the research findings more accurate for a wider population.
4. Including additional medical variables to enhance the clinical value of the research, such as medical independent variables that influence the level of surgical difficulty, including the morphology or number of roots of the M3 tooth, and the density of the jawbone

ETHICS APPROVAL:

This research has been approved by the Health Research Ethics Committee

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