

## ORIGINAL ARTICLE

# Knowledge Attitude and Practice of General Practitioners and Interns Toward Late Mandibular Incisors Crowding; A Cross sectional study in Saudi Arabia.

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## ABSTRACT

**Objective:** This study aimed to assess and compare the knowledge and awareness of dental interns and general practitioners in Saudi Arabia about late mandibular incisor crowding.

**Materials and methods:** This is a cross-sectional study which was conducted between June 2020 and July 2020 in Saudi Arabia and it observed dental practitioners.

**Results:** A total of 275 subjects were included in this study; 172 (62.5%) were dental interns, 157 (57.1%) were females and 211 (76.7%) dentists were aged between 23-26 years. While most general practitioners and dental interns have heard about late mandibular incisors crowding, the majority continue to abstain from not recommending extraction of lower third molar as a means of prevention. Around half of the respondents, 134 (48.7%), claimed that the eruption of lower third molars is a possible causative factor. A greater percentage of general dental practitioners, 32 (31.1%) believed that there is a correlation between late mandibular incisors crowding and cases of relapse after an orthodontic treatment. Moreover, male participants were more knowledgeable of the fact that cases may worsen if not treated ( $P = 0.019$ ). The knowledge of lower third molars eruption ( $P = 0.002$ ) and unerupted/impacted lower third molars ( $P = 0.034$ ) ability to cause late mandibular incisors crowding and the prophylactic extraction of the lower third molars ( $P = 0.009$ ) were also significantly differed across the various age groups.

**Conclusion:** Late mandibular incisor crowding is one of the main clinical issues in dental practice which has been subject to decreased awareness among dentists.

**Keywords:** Dentists, knowledge, late mandibular incisor crowding, Saudi Arabia.

## INTRODUCTION

Teeth crowding occurs mainly as a consequence of a lack of space in the dental arch. Late mandibular incisors crowding, in particular, is a well-recognized clinical problem in both treated and untreated subjects. It has been reported to occur in early adulthood and adolescence between the ages of 13 and 26 years (1).

This phenomenon has been frequently observed with the eruption of third molars, and it remains a controversial issue whether or not third molars have a role in the development of malocclusion in the anterior segment. Sidlauskas and Trakiniene concluded in their study that there was no evidence to claim third molars as a possible etiologic factor for this phenomenon (2). They also reported no statistically significant association between unerupted and erupted agenesis of third molars with late mandibular incisor crowding (2). Therefore, third molar extraction, as a preventive measure to avoid late mandibular incisor crowding or post orthodontic relapse, is not justified yet (3, 4). Furthermore, research suggests that medially and distally directed forces, incisor up righting, complex growth pattern, skeletal structure, soft tissue maturation, occlusal factors, tooth morphology, and orthodontic treatment may cause late mandibular incisor crowding solely or in combination (1, 5).

Generally, the precipitating cause is multifactorial; however, some factors may have a greater impact compared to the others (5). However, it has been an argumentative subject whether or not the lower third molar may contribute to relapse after orthodontic treatment. Some believe that the increase in crowding at adolescence and early adulthood could be evidence of the third molar role. According to Bishara et al.'s study, it was found that crowding is strongly associated with aging (6).

This study aimed to assess and compare the knowledge and awareness of dental interns and general practitioners in Saudi Arabia about late mandibular incisor crowding.

## METHODOLOGY

**Study design:** This is a cross-sectional study which was conducted using a self-administered questionnaire which was circulated across Saudi Arabia between June 2020 and July 2020. The study was conducted in accordance with the Declaration of Helsinki and adhered to Good Clinical Practice guidelines. The survey was then completed anonymously and a written informed consent was obtained from all respondents.

**Data collection :** The survey was available in both English and Arabic for more convenience and it included several questions regarding the participant's demographics,

previous exposure to orthodontic treatment which facilitates data reading, and the causes of late mandibular incisors crowding.

**Participants eligibility :** The study included Saudi Arabian dentists and dental interns practicing dentistry in Saudi Arabia.

**Sample size calculation:** The minimally required sample size was thus estimated to be 250 using OpenEpi calculator where the confidence level was set as 95% and the level of error as 5%.

**Primary and secondary outcomes :** The primary outcome of this study was to assess the Saudi Arabian dentists' knowledge and awareness of late mandibular incisors crowding. The secondary outcome was to study the association between the participants' responses and their sociodemographic characteristics.

**Statistical analysis:** Data were analyzed using the statistical analysis software package (IBM-SPSS, version 25, Armonk; NY). Descriptive statistics of frequency distribution and percentages were calculated for categorical variables. Chi-squared test was also applied to assess the differences among different groups. A p-value of < 0.05 was considered significant for all statistical purposes.

**RESULTS**

Table 1: Distribution of the study participants (n=275)

Variables	n	%	
Category	Intern	172	62.5%
	General practitioner	103	37.5%
	Total	275	100.0%
Gender	Male	118	42.9%
	Female	157	57.1%
	Total	275	100.0%
Age (years)	23-26	211	76.7%
	27-30	45	16.4%
	Above 31	19	6.9%
	Total	275	100.0%

**Participants' characteristics:** Table 1 demonstrates the demographic characteristics of the study participants. A total of 275 subjects responded to all of the study's questions. The majority of the study participants, 172 (62.5%), were dental interns while the rest, 103 (37.5%), were general dental practitioners. The majority of the respondents, 157 (57.1%), were females and aged between 23-26 years, 211 (76.7%), while only 45 (16.4%) participants were aged between 27-30 years and 19 (6.9%) others were aged above 31 years.

**Participants' knowledge of late mandibular incisors crowding:** Almost three-quarters of the study participants, 216 (78.5%), were aware of the late mandibular incisors crowding. Furthermore, the majority of the respondents, 190 (69.1%), believed that late mandibular incisors crowding among adolescents might have a physiological origin. When asked about the causes of mandibular incisors crowding, around half of the respondents, 134 (48.7%), claimed that the eruption of lower third molars is a possible causative factor, while around one-quarter, 79 (28.7%), believed that unerupted/impacted lower third molars are to be blamed, while only 61 (22.2%) assumed that cases of relapse might occur even after an orthodontic treatment. It is worth mentioning that late mandibular incisors crowding is also possible in patients who have never had an orthodontic treatment, as claimed by three-fourth 208 (75.6%) of the study participants. Moreover, more than half of the participating dentists, 143 (52.0%), agreed that these late mandibular incisors crowding cases may get worse spontaneously if not treated. Hence, more than three-quarters, 238 (86.5%), of the participants insisted to refer these cases to a specialist. Around one-third, 104 (37.8%), participants considered that the prophylactic extraction of lower third molars is a useful means to prevent late mandibular incisors crowding (Table 2, Figure 1). Association between the participants' characteristics and knowledge

Table 2: Positive responses of the study participants

Items	Questionnaire items	n	%
K1	Ever heard of late mandibular incisors crowding	216	78.5%
K2	Late mandibular incisors crowding among adolescents might be physiological	190	69.1%
K3	The eruption of lower third molars can cause late mandibular incisors crowding	134	48.7%
K4	Unerupted/impacted lower third molars can cause late mandibular incisors crowding	79	28.7%
K5	The prophylactic extraction of lower third molars is useful to prevent late mandibular incisors crowding	104	37.8%
K6	Late mandibular incisors crowding only occurs in cases of relapse after an orthodontic treatment	61	22.2%
K7	Patients who have never had an orthodontic treatment might also show late mandibular incisors crowding	208	75.6%
K8	Should refer these cases to specialists	238	86.5%
K9	These cases may get worse spontaneously if not treated	143	52.0%

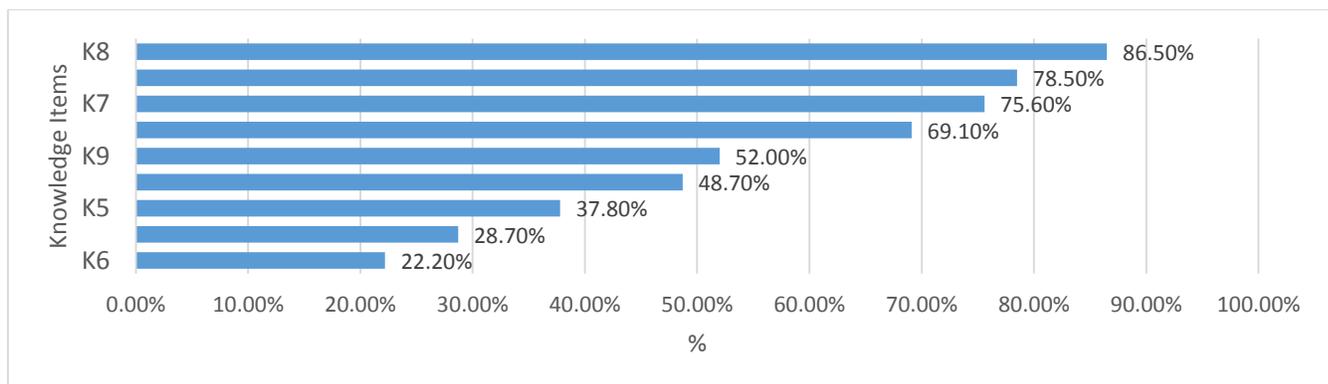


Figure 1 Positive responses to the questionnaire items (n=275); K1: Ever heard of late mandibular incisors crowding; K2: Late mandibular incisors crowding among adolescents might be physiological; K3: The eruption of lower third molars can cause late mandibular incisors crowding; K4: Unerupted/impacted lower third molars can cause late mandibular incisors crowding; K5: The prophylactic extraction of lower third molars is useful to prevent Table 3: Knowledge of Late mandibular incisor crowding in different groups

late mandibular incisors crowding; K6: Late mandibular incisors crowding only occurs in cases of relapse after an orthodontic treatment; K7: Patients who have never had an orthodontic treatment might also show late mandibular incisors crowding; K8: Should refer these cases to specialists ; K9: These cases may get worse spontaneously if not treated.

Items	Job position				p <sup>*</sup>	Gender				p <sup>*</sup>	Age						p <sup>*</sup>	
	Intern		GP			Male		Female			23-26		27-30		Above 31			
	n	%	n	%		n	%	n	%		n	%	n	%	n	%		
K1	No/DK	37	21.5	22	21.4	0.976	27	22.9	32	20.4	0.617	48	22.7	10	22.2	1	5.3	0.204
	Yes	135	78.5	81	78.6		91	77.1	125	79.6		163	77.3	35	77.8	18	94.7	
K2	No/DK	56	32.6	29	28.2	0.444	32	27.1	53	33.8	0.238	65	30.8	17	37.8	3	15.8	0.22
	Yes	116	67.4	74	71.8		86	72.9	104	66.2		146	69.2	28	62.2	16	84.2	
K3	No/DK	91	52.9	50	48.5	0.484	57	48.3	84	53.5	0.393	118	55.9	20	44.4	3	15.8	0.002
	Yes	81	47.1	53	51.5		61	51.7	73	46.5		93	44.1	25	55.6	16	84.2	
K4	No/DK	124	72.1	72	69.9	0.698	87	73.7	109	69.4	0.435	157	74.4	30	66.7	9	47.4	0.034
	Yes	48	27.9	31	30.1		31	26.3	48	30.6		54	25.6	15	33.3	10	52.6	
K5	No/DK	110	64.0	61	59.2	0.434	70	59.3	101	64.3	0.397	141	66.8	23	51.1	7	36.8	0.009
	Yes	62	36.0	42	40.8		48	40.7	56	35.7		70	33.2	22	48.9	12	63.2	
K6	No/DK	143	83.1	71	68.9	0.006	93	78.8	121	77.1	0.731	170	80.6	33	73.3	11	57.9	0.055
	Yes	29	16.9	32	31.1		25	21.2	36	22.9		41	19.4	12	26.7	8	42.1	
K7	No/DK	45	26.2	22	21.4	0.369	33	28.0	34	21.7	0.228	52	24.6	10	22.2	5	26.3	0.923
	Yes	127	73.8	81	78.6		85	72.0	123	78.3		159	75.4	35	77.8	14	73.7	
K8	No/DK	24	14.0	13	12.6	0.754	12	10.2	25	15.9	0.166	28	13.3	6	13.3	3	15.8	0.953
	Yes	148	86.0	90	87.4		106	89.8	132	84.1		183	86.7	39	86.7	16	84.2	
K9	No/DK	84	48.8	48	46.6	0.72	47	39.8	85	54.1	0.019	104	49.3	18	40.0	10	52.6	0.482
	Yes	88	51.2	55	53.4		71	60.2	72	45.9		107	50.7	27	60.0	9	47.4	

DK=Don't know, GP=General Dental Practitioners, \* Chi-square test

The knowledge of late mandibular incisor crowding was assessed based on the respondents' characteristics as illustrated in Table 3.

A greater percentage of general dental practitioners, 32 (31.1%), responded positively to the sole occurrence of late mandibular incisors crowding in cases of relapse after an orthodontic treatment compared to only 29 (16.9%) of dental interns (P = 0.006). Moreover, most participants who agreed to the fact that the late mandibular incisor crowding cases may worsen spontaneously if not treated were males (60.2%, P = 0.019). The knowledge of lower third molars eruption (P = 0.002) and unerupted/impacted lower third molars (P = 0.034) ability to cause late mandibular incisors crowding was also significantly different across the various age groups. Similarly, the knowledge of the prophylactic use of extraction of the lower third molars for the prevention of late mandibular incisors crowding differed significantly across age groups (P = 0.009) (Table 3).

**DISCUSSION**

Several factors are associated with the occurrence of mandibular incisor crowding, and it is important to consider them all. At various stages of cranial development, the action of multiple factors may contribute to the lower mandibular incisor crowding (16). One of the factors that can cause an increase in crowding and shortening of the dental arch is the forward movement of the posterior teeth

backed up by the pressure on the back of the dental arch caused by physiological mesial slide (16). However, the anterior component of occlusal force on mesially inclined teeth or the mesial vector are caused by muscle contraction (22). Moreover, late mandibular growth can contribute to lower anterior crowding by provoking changes in the complex growth pattern. In this regard, the dental balance might be altered by the changes in the muscular function of the cheeks and lips. Mouth breathing may also cause lower incisor crowding due to produced muscular imbalance (16).

In this study, around half of the included participants (48.7%) assumed that the eruption of lower third molars can cause late mandibular incisors crowding, while around one-third of them (28.7%) claimed that unerupted/impacted lower third molars can cause late mandibular incisors crowding. Karasawa et al. results showed no correlation between the impacted or erupted third molar and the occurrence of late lower incisor crowding (16). Thus, the prophylactic extraction of third molars remains controversial among dental professionals (23). In the present study, an approximate one-third, 104 (37.8), of the participating dentists agreed with the usefulness of prophylactic extraction of lower third molars for the prevention of late mandibular incisors crowding. However, Karasawa et al. found that there is a valid evidence is still lacking regarding the prophylactic extraction of asymptomatic lower third

molars to avoid the late mandibular incisor crowding, where it does not prevent or reduce the incidence of late incisor crowding (16). Furthermore, the study participants suggested that there is a correlation between the relapse after an orthodontic treatment and late mandibular incisors crowding. Similarly, Karasawa et al. 's showed a little correlation between wearing orthodontic appliances and mandibular incisor crowding (odds ratios < 1.0) (16).

In this study the knowledge of late mandibular incisor crowding was assessed across different categories—gender, age, and job position of the study participants.

## CONCLUSION

Late mandibular incisor crowding is one of the main clinical issues faced in dental practice. The role of erupting third molars as a reason for such dental crowding has been a controversial subject over the years. While most general practitioners and dental interns have heard about late mandibular incisors crowding, the majority of them continue to abstain from not recommending extraction of lower third molar as a means of prevention of lower mandibular incisors crowding. For these reasons, we believe that there is a pressing need for a better insight to figure out a definitive management.

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