Association between Knowledge, Attitude, Barriers, and Practice of Parents regarding Children's Malocclusion in Yangon, Myanmar

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ความสัมพันธ์ระหว่างความรู้ ทัศนคติ อุปสรรค และพฤติกรรมการดูแลการสบฟันผิดปกติในเด็กของพ่อแม่ ในเมืองย่างกุ้ง ประเทศเมียนมา

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เย เด็ด อ่อง : ความสัมพันธ์ระหว่างความรู้ ทัศนคติ อุปสรรค และพฤติกรรมการดูแลการสบฟันผิดปกติในเด็กของพ่อแม่ ในเมืองย่างกุ้ง ประเทศเมียนมา. (Association between Knowledge, Attitude, Barriers, and Practice of Parents regarding Children's Malocclusion in Yangon, Myanmar) อ.ที่ปรึกษาหลัก : อรอุมา ซองรัมย์Ph.D., อ.ที่ปรึกษาร่วม : นุชนาฏ หวนนากลางPh.D.

การสบฟันผิดปกติเป็นหนึ่งในปัญหาสุขภาพช่องปากที่สำคัญทั่วโลกในเด็ก ซึ่งอาจส่งผลต่อลักษณะใบหน้าของเด็กและสามารถนำไปสู่ผลกระทบทางจิตวิทยาได้ ดังนั้นการศึกษานี้มีวัตถุประสงค์เพื่อหาความสัมพันธ์ระหว่างความรู้ ทัศนคติ อุปสรรค และพฤติกรรมการดูแลการสบฟันผิดปกติในเด็กของพ่อแม่ โดยทำการศึกษาภาคตัดขวางในกลุ่มตัวอย่างพ่อแม่ที่มีอายุระหว่าง 20-50 ปี มีลูกอายุระหว่าง 6-12 ปี และอาศัยอยู่ในเมืองย่างกุ้ง ประเทศเมียนมา ใช้แบบสอบถามแบบตอบด้วยตนเองที่มีความตรงในการเก็บข้อมูลคุณลักษณะทางประชากร ความรู้ ทัศนคติ อุปสรรค และพฤติกรรมการดูแลการสบฟันผิดปกติในเด็กของพ่อแม่ทางออนไลน์ ผลการศึกษาพบว่ามีผู้ตอบแบบสอบถามครบถ้วนจำนวน 388 คน มีอายุ 21-50 ปี มีคะแนนเฉลี่ยของความรู้ ทัศนคติ และพฤติกรรมการดูแลการสบฟันผิดปกติในเด็ก เท่ากับ 9.3, 18.7 และ 7.6 ตามลำดับ พ่อแม่ส่วนใหญ่ (45.6%) มีจำนวนอุปสรรคในการรักษาความผิดปกติของการสบฟันในเด็ก 6 ด้าน ผลการวิเคราะห์การถดถอยเชิงเส้นแบบพหุคูณแสดงให้เห็นว่าปัจจัยที่มีอิทธิพลต่อพฤติกรรมการดูแลการสบฟันผิดปกติในเด็กของพ่อแม่ มี 3 ด้าน ได้แก่ ความรู้ ($\beta = 0.647$, $p < 0.001$) ทัศนคติ ($\beta = 0.187$, $p < 0.001$) และอุปสรรคด้านความไม่สวยงามของใบหน้าเด็กเมื่อใส่อุปกรณ์จัดฟัน ($\beta = -0.156$, $p < 0.001$) การศึกษานี้เน้นถึงความสำคัญของความรู้ ทัศนคติ และอุปสรรคของพ่อแม่ที่มีอิทธิพลต่อพฤติกรรมการดูแลการสบฟันผิดปกติในเด็กในเมืองย่างกุ้ง ประเทศเมียนมา ดังนั้นการเสริมพลังพ่อแม่ด้วยความรู้ การสร้างเสริมทัศนคติเชิงบวก และการลดอุปสรรคด้านความไม่สวยงามของใบหน้าเด็กเมื่อใส่อุปกรณ์จัดฟันสามารถสนับสนุนให้พ่อแม่มีพฤติกรรมการดูแลเด็กเพื่อการป้องกันและรักษาการสบฟันผิดปกติได้

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Malocclusion is one of the significant global oral health problems among children. It may affect the facial appearance of children and can lead to psychological impacts. Therefore, this study aimed to investigate the association between knowledge, attitude, barriers, and practices of parents toward malocclusion in children. This cross-sectional study was conducted on parents, aged between 20 and 50 years, having children aged between 6 and 12 years, and living in Yangon, Myanmar. Parental socio-demographic characteristics, knowledge, attitudes, barriers, and practices regarding malocclusion in their children were surveyed and collected through an online validated self-administered questionnaire. A total of 388 participants aged from 21 to 50 years completed the survey questionnaire. The average scores of parental knowledge, attitude, and practice regarding malocclusion in children were 9.3, 18.7, and 7.6 respectively. Most of the parents (45.6%) had 6 barriers to malocclusion treatment. Multiple linear regression analysis showed that all three factors including parental knowledge ($\beta = 0.647$, $p < 0.001$), attitude ($\beta = 0.187$, $p < 0.001$), and barrier concerning with uncomfortable appearance of orthodontic brackets ($\beta = -0.156$, $p < 0.001$) significantly influence parents' practices regarding children's malocclusion. This study underscores the significance of parental knowledge, attitude, and barriers in influencing parents' practices concerning children's malocclusion in Yangon, Myanmar. Empowering parents with knowledge, fostering positive attitudes, and reducing the barrier of the uncomfortable appearance of orthodontic brackets can encourage them to take proactive steps in preventing and treating malocclusion in their children.

Field of Study:	Public Health	Student's Signature .....
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		Co-advisor's Signature .....

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List of Abbreviations

ANOVA	Analysis of Variance
B.D.S.	Bachelor of Dental Surgery
DAI	Dental Aesthetic Index
IOC	Item Objective Congruence Index
NGO	Non-government Organizations
NICE	National Institute of Health and Care Excellence
OHRQoL	Oral Health-related Quality of Life
QoL	Quality of Life
TMJ	Temporomandibular Joint
WHO	World Health Organization
UN	United Nations
YCDC	Yangon City Development Committee

Chapter 1

Introduction

1.1. Background and Rationale

Malocclusion, which is the deviation in the alignment of the teeth within the arch or between the upper and lower arch, marks as a major oral health problem globally (1). It is not a disease but a morphological variation not associating with pathological conditions. Malocclusion is considered to be one of the most prevalent oral pathologies, secondary to dental caries and periodontal disease. It is the third most prevalent among worldwide dental public health disease priorities (2).

According to Angle's classification, Malocclusion is classified into three groups according to three different spatial planes: sagittal, vertical and transverse. They are Class I or neutral occlusion, Class II or distocclusion and Class III or mesiocclusion. Another criterion used to classify malocclusion is Dental Aesthetic Index (DAI) which includes crowding, spacing, median diastema, increased overjet, increased overbite, anterior and posterior open bite (3).

Children with malocclusion like dento-facial disharmonies seeking treatment experience a level of mental distress warranting psychological and psychiatric consultation (4). Thus, the most common reasons for seeking orthodontic professional help are due to problems in biting and chewing, temporomandibular disorders, and headache which has a considerable impact on daily routine activities of children (5).

The children with malocclusion are being bullied because of their dento-facial appearance and these negative effects can have an impact on oral conditions on social life and a positive sense of dentofacial self-confidence. Bullying can be defined as a

situation when a person has been subjected to unfavorable behaviors frequently and over time by one or more individuals. The unfavorable behaviors can be grouped into two actions, directly, for instance, physical assault such as hitting, kicking, insults, and threats, and indirectly, for example, gossip, spreading of rumors, and social exclusion, which can result deleterious effects to the victim. The previous studies showed that the prevalence of bullying among schoolchildren aged 11 to 12 years of age was 47%, and school boys are being bullied more than school girls. Among maxillofacial abnormalities, the three most bullied appearances are dental spacing or missing teeth, shape and shade of the teeth for example, teeth staining and proclined upper incisors. Therefore, dental appearances were the feature most frequently targeted for bullying, followed by strength and being obese or skinny. Orthodontic treatment has a considerable impact on children's oral health–related quality of life (OHRQoL) because those children with malocclusion are being bullied by their unappealing dento-facial appearance (6).

In a previous study, the prevalence of malocclusion among children in a global level is 56% without relevant gender difference. One out of two children have malocclusion in which it is a highly prevalent condition in a global level. When it comes to malocclusion distribution regarding continents, there were higher percentage scores, that is, 81% in Africa and 71% in Europe, and 53% in America and 48% in Asia (7). Regards to Angle's classification, approximately two-third of the population had Class I malocclusion during both primary and permanent dentitions. In the remaining one-third of the population, Class II exhibited three times more prevalent than Class III in both the permanent and primary dentitions. Considering the case of overjet, about 70% of children and adolescents have normal overjet, with no different

percentage in primary and permanent dentitions. Yet, the remaining 30% showed increased overjet, seven-fold more frequent than reversed overjet in both primary and permanent dentitions (7). Considering overbite, the normal overbite in children represented the most relevance of the population, which is 69.5% in the primary dentition and 64.5 % in permanent dentitions. But in cases of overbite, deep bite was found to be more prevalent than open bite (7). In reference to these prevalence evidences, malocclusion marks not only a considerable oral health problem but also a financial burden for either to the family and to the dental health public services (7). From these evidences, malocclusion prevalence is not declined from age to age and thus, we must consider carefully and pay attention to prevent this dento-facial irregularity before it happens.

In India, the prevalence of malocclusion was 35.40%. When stratified by gender, males had a more prevalence of malocclusion which is 36.20% than 31.98% in females. Prevalence of malocclusion was exhibited to be greater among the urban population (32.78%) in contrast to rural population (26.07%). According to regional view, South India was found to be highly prevalent of malocclusion which is 39.58% when compared with other regions of the country (8).

The nationwide prevalence of malocclusion in children is 47.92% in China. Regarding gender, there is a slightly greater prevalence in males than in females which is 46.52% and 44.44% respectively. In the case of Angle's classification, class I malocclusion was found to be the highest prevalence with 30.07% followed by Class II malocclusion and Class III malocclusion with 9.91% and 4.76% respectively.

Geographically, 57.26% of schoolchildren in Northern China showing that it is the most prevalent among other regions in China (9).

In Saudi Arabia, in accordance with Angle's Classification, Class I malocclusion is the most prevalent with 52.8% of children followed by Class II affecting 31.8% and Class III malocclusion with the least prevalent rate of 15.4%. They also exhibited that they show more normal parameters in overjet and overbite. Yet when it comes to dental spacing, most of the children did not have spacing, anterior and posterior cross bite, and open bite (10).

Malocclusion is also influenced by many etiological factors which includes genetics and environmental factors. Genetic factors are highly susceptible to malocclusion. Heritability proportions have been exhibited with many dental and facial features such as mid and lower facial parts, such as spacing, crowding and Bolton type tooth size discrepancies with the prevalence rate of more than 60% which is considered to be moderate to high (11). Hereditary factors can be found during the growth of the children and however, it can consequently lead to develop malocclusion as well as it also influences to come together with oral bad habits. When it comes to thumb sucking habits, the child places his or her thumb, between maxilla (upper arch) and mandible (lower arch) which can cause the tongue to move downwards. In this position, the tongue is restricted to touch its correct position on the palatal region, which limits its movement and muscle development; furthermore, the position of the thumb unable the incisal teeth causing their prominence. Consequently, an anterior open bite and posterior cross-bite are resulted due to lack of palatal development (12).

Another oral habit in most of the children is lip or cheek sucking which can cause oral health problems effecting the skeletal-facial development. In patients having this oral habit, there is muscle contraction of the lower orbicularis muscle and mental muscle which unable to pro-cline the upper incisal teeth, as well as retro-cline of the lower incisal teeth, that can consequently cause increased overjet, and misalignment of the lower incisors (13). Nasal airway obstruction can also cause oral respiration which is considered to cause malocclusion, for instance, by adenoid or palatine tonsil hypertrophy, rhinitis, turbinate hypertrophy. Patients with oral respiration cannot breathe through the nasal airway, however, they breathe through the oral cavity and this consequently results dental and skeletal problems, for example, open bite, clockwise rotation of the mandible, prognathism and narrow palate (14).

The treatment of malocclusion places a financial burden on health care resources worldwide, in the case of public funds. When prioritizing the orthodontic treatment, different kinds of occlusal indices are being developed depended on the severity of malocclusion. Therefore, it has been recognized for a long time that people seek and undergo orthodontic treatment not due to the facio-dental anomalies, yet due to the consequences of dissatisfaction in aesthetic appearance caused by malocclusion. However, malocclusion and orthodontic treatment have become a quality-of-life (QoL) issue (15). In the 21st century, the orthodontics has become a trend regarding the use of esthetic treatments and materials. In the recent days, the orthodontic treatments become more advanced that the brackets are becoming smaller; esthetical appliances are also available as another alternative option for patients who are unwilling to use metallic brackets. Despite this, the number of

children who are left untreated still become high among children who are socially vulnerable, resulting in a consider burden to oral health. In accordance of the social and economic inconsistencies in Myanmar due to the pandemic and the political condition, these individuals have a scanty access to the treatment of malocclusion not only due to their families' necessary needs for limited resources and the limited availability of orthodontic professionals in their local communities. Furthermore, orthodontic treatment trends and their procedures are unavailable in dental insurance, resulting in people with low financial status failing to receive such facilities (16).

Mixed dentition in children usually starts at 6 years of age and ends at 12 years of age (9). It is also termed as the period when both the deciduous and permanent teeth are present at the same time in the upper and lower dental arches with an abundant range of deviations, for example, physiological occlusal changes at this stage. This usually begins with the eruption of the first permanent molar. At the same time to these changes, malocclusions may be resulted (17). Early orthodontic intervention should be considered and provided in order to prevent the development of malocclusion and to eliminate factors interfering with the regular development of the dental arches. Maxillofacial appearance has a long-lasting implication on people especially the younger generation. An unacceptable dental esthetics has often been associated with a negative effect on self-esteem, career development and peer acceptance. To protect the impact on their mental health, children having from very severe to moderate malocclusion should be accessed and corrective treatments and interventions should be instituted as soon as possible (18). Another reason to access early orthodontic treatment is the prevent the dental traumatic injury in patients with proclined teeth (19). The past studies have proved that if malocclusion is left

untreated during the mixed dentition phase, it can cause malocclusion in permanent dentition. Consequently, the negative impact of malocclusion during mixed dentition, may result deleterious effects in the emotional and social aspects of children in the early ages (9).

Yangon is the formal capital city of Myanmar being the most populated city with the total population of 7,360,703 which comprises 14.3% of the nationwide population of Myanmar (20). Being the largest city itself, it is significant in Myanmar's political, economic, and cultural history. Many citizens from different areas of the country migrate to this city for their living and work, which results in different forms of social and cultural levels (21), Almost 30% of the total population of Myanmar live in urban areas. The population is distributed by Myanmar's three major cities, which comprises 50% of Myanmar's urban population - Yangon (5.21 million), Mandalay (1.22 million), and Nay Pyi Taw (1.16 million). However, in Yangon or in nationwide, there is a limited number of studies regarding malocclusion or assessment of knowledge, attitude and practice relating the malocclusion in children (20).

The majority of children are the orthodontic patients and the parents contribute the important role in performing orthodontic management for their offspring in which they have similar perceptions as dentists' viewpoints and evaluations of dento-facial deformities (22). Parents follow orthodontic treatment for their children's oral health promotion and function and prevention of social stigma either. There are some evidences that the parents with previous history of orthodontic treatment or willing to receive this treatment now, are more interested to implicate this treatment for their

children (23). Furthermore, seeking treatment depends on parents' perceptions, concerns, desire, and motivations as this involves their children. Since children are still dependent on their parents in a financial and decisive way, the final decision is done by their parents (24). Thus, determination of parents' knowledge and attitudes and practice to early appliance of orthodontic treatment for their children are mandatory and are important value (23, 24).

In the worldwide level, there are a lot of studies concerning malocclusion in children, knowledge, attitude, barriers and practice of parents regarding malocclusion in children, and overall prevalence of malocclusion especially Brazil, Saudi Arabia, and India, yet there is a limited study of such issues in Myanmar. Affordable and acceptable dental care is still unavailable in Myanmar, due to the limited health workforce and economic crisis due to the unstable political transitions. From this, the parents and children are difficult to access the regular check-ups, care and treatment of malocclusion. Moreover, there is no policy implementation concerning with primary dental care and no dental health insurance to access the dental check-ups. This research will provide the parental knowledge, attitude and practice of malocclusion in children and describe the barriers to access the treatment of malocclusion in which it will be necessary in implementing the policies and in primary dental care in Myanmar.

1.2. Research Questions

- Is there any association between parents' individual characteristics, knowledge, attitude, barriers with practice regrading malocclusion in children?

1.3. Research Objectives

General Objective

- To study the knowledge, attitude, barriers and practice of parents on malocclusion in children living in Yangon, Myanmar

Specific Objectives

- To investigate the association between parents' individual characteristics, knowledge, attitude, barriers and practice regrading malocclusion in children

1.4. Hypothesis

Null Hypothesis

There is no association between knowledge, attitude, barriers with practice regarding malocclusion in Children.

Alternative Hypothesis

There is an association between knowledge, attitude, barriers with practice regarding malocclusion in Children.

1.4. Conceptual Framework

Independent Variable **Dependent Variable**

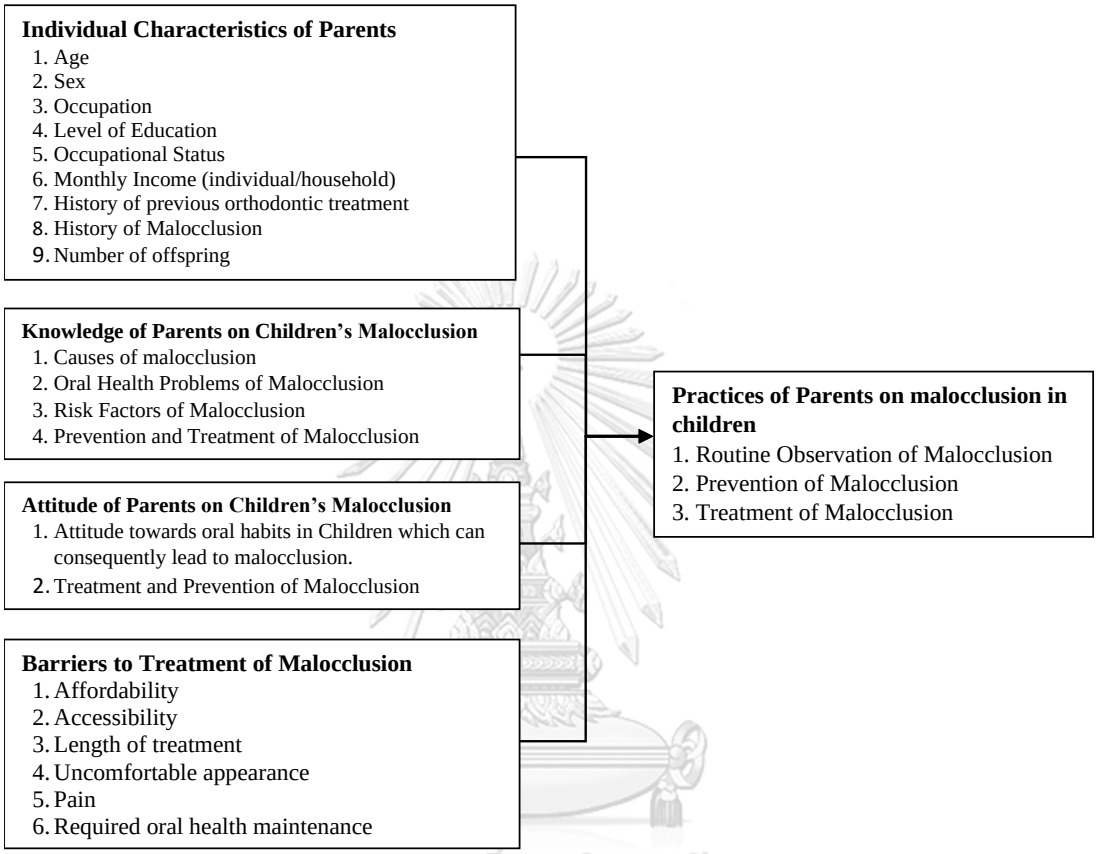

Figure 1. Conceptual Framework

1.5. Operational Definitions

Parents – Parents including father, mother and primary caregiver residing at Yangon aged between 20 to 50 years having children of 6 to 12 years of age.

Malocclusion – Malocclusion is defined as the malposition of the teeth and/or the dental arches beyond the range of what is accepted as normal (25).

Serial Extraction – a sequential procedure of premature removal of one or more deciduous teeth in order to improve the permanent teeth to align in a normal

relationship followed by the removal of permanent teeth if necessary to achieve the proper ratio between tooth size and arch size (26).

Routine Dental Check-ups – the maintenance of good oral health which is an integral component of systemic health. Routine dental check-up must be carried at least once a year. (27).

Orthodontic Treatment – is the treatment which corrects the malocclusion to achieve functionally sound and acceptable occlusion and appealing dental and facial aesthetics. For example, fixed appliances (braces), and removeable appliances (clear aligners, retainers, space maintainers, palate expanders (28).

Barrier – is any action which limits the access to dental care services due to the out-of-pocket payment system, lack of awareness, lack of human resources, low income and lack of insurance coverage (29).

Table 1. Operational Definitions for Individual Characteristics

Individual Factors	**Operational Definitions**
Age	The completed age in years of the respondent
Sex	Sex at birth of the respondent
Occupation	The type of work or job that the respondent is currently doing. In this study, they are unemployed, government officer, professional, company employee, freelancer, and others. **Unemployed –** means respondent who is unemployed or is currently seeking an employment. **Government officer** – means respondent who is currently working as an officer in any government of state

	Professional - means a respondent whose job requires special education, skill, or training referring to those working as doctors, engineers, nurses, laboratory technicians, teachers, professors, lawyers, judges, IT/computer technicians, researchers, scientists, traders, business owners. **Company Employee** – means a respondent at which the business owner or company owner hires him or her to perform a service. **Freelancer** – means a respondent who is paid on a per-job or per-task basis, in which it is usually a short-term work without any dependent contractor. **Others** – means occupations not listed above.
Parental level of Education	The respondent's education level which can be middle school or less, high school, undergraduate level, graduate level, postgraduate level.
Monthly Income	It includes both a range of individual's and household's income.
History of Previous Orthodontic Treatment	It means that a respondent who previously received orthodontic treatment at least once in a lifetime.
History of Malocclusion	It means a respondent has a history of malocclusion assessed by the dentists or orthodontists.
Number of Offspring	It means the number of children that a respondent has.
History of Oral Habits	It means the habits that can consequently cause malocclusion. For example, tongue thrusting, mouth breathing, and thumb sucking habit.

Children Level of Education	It means the education level of a respondent's children including primary or secondary level.

Table 2. Operational Definitions on Parental Knowledge on Malocclusion in Children (30)

Knowledge about Causes of Malocclusion	**It means the knowledge of the respondent regarding the causes of malocclusion in children. The etiological factors of malocclusion include:** 1. **hereditary factors,** 2. **oral bad habits such as thumb sucking, mouth breathing, and tongue thrusting,** 3. **dietary factors such as high sugar consumptions, and** 4. **early tooth loss.**
Knowledge of the respondents about Oral Health Problems of Malocclusion	It means the knowledge of respondents regarding the oral health problems which are the consequences of malocclusion. It includes: 1. Esthetic Problem like sticky-out tooth 2. Social Problems like school bully on facial appearance 3. Functional or masticatory problem like chewing problem
Knowledge of the respondents about Risk Factors of Malocclusion	It means the knowledge of respondents regarding the risk factors of malocclusion. It consists of: 1. Traumatic Risk 2. Gingivitis/ Periodontitis 3. Early tooth loss due to caries

Knowledge of the respondents about Prevention and Treatment of Malocclusion	It means the knowledge of respondents concerning on how to prevent malocclusion in children. It includes: 1. Changing diet habits 2. Serial extraction 3. Avoiding oral bad habits like thumbsucking, mouth breathing, tongue thrusting 4. Taking their offspring to the dental clinics and consult with orthodontist and perform orthodontic treatment.

Table 3. Operational Definitions of Parental Attitude on Malocclusion in Children (23)

Attitude towards oral habits in Children which can consequently lead to malocclusion.	**Certain type of oral habits can lead to dento-facial problem in children. These oral habits include oral respiration (mouth breathing), thumb sucking, tongue thrusting.**
Attitude towards treatments and prevention of malocclusion	It means parental attitudes on treatments and preventions for malocclusion in children. It includes consulting with dentists and regularly attending the dental clinics once a year and receive the necessary preventive measures such as using space maintainers to prevent the mesial drift of first permanent molars due to the early loss of deciduous molars and mouth guards in order to prevent the anterior open bite caused by thumb sucking habit.

Table 4. Operational Definitions on Barriers Towards the Treatment and Care of Malocclusion (31)

Barriers towards treatment of malocclusion	**It means the respondents' barriers in accessing the orthodontic treatment in children. These includes** **1. Affordability** **2. Accessibility** **3. Length of treatment** **4. Uncomfortable appearance** **5. Pain** **6. Required oral health maintenance**

Table 5. Operational Definitions of Parental Practice of Malocclusion in Children (25)

Parental practice of routine observation of malocclusion in children	**It means the regular observation of children's orofacial appearance and its associated oral habits. This includes alignment of the upper and lower teeth, presence or absence of jaw problems, and oral bad habits.**
Parental practice of treatment of malocclusion in children	It means the parents' perceptions and overall performance concerning with not only the malocclusion but also the oral health of the children. This includes the regular visit to the dental clinics, the treatment choices of malocclusion and the timing of the treatment for malocclusion.
Parental practice on prevention of malocclusion in children	It means parents' practice on preventing the risk behavior which can lead to malocclusion and the application of the orthodontic appliance. This includes changing diets, timely treatment, avoidance of oral bad habits the use of the orthodontic appliances (30).

1.6. Expected Benefits

This study has a potential to improve the mental well-being of the children and thus, promote the adolescents' health. However, this study emphasizes to fill the research gap of malocclusion by exploring the levels of knowledge, attitude, barriers and practice of parents regarding malocclusion in children. Moreover, this study can be the synergistic effect to make and implement new policies concerning with not only the dental health problems but also the dental health insurance for the health equity of the community who are in need.

Chapter 2

Literature Review

2.1. What is Malocclusion

Malocclusion is one of the major oral health problems affecting the oral health-related quality of life because of its impact on appearance, function, social interactions, and psychological well-being. These effects will be even more potent especially in children and adolescents representing the greatest proportion of orthodontic referrals (25). Malocclusion is the third most common oral pathology worldwide, after dental caries and periodontal disease, and is consequently the third most important dental disease in terms of public health dental disease priorities (32).

2.1.1. Definition of Malocclusion

Malocclusion is termed as the misalignment of the teeth and/or abnormal relationship between the upper and lower jaws during occlusion (7). Although malocclusion is not a disease yet a set of dental deviations. In some cases, it can influence the quality of life (32).

2.1.2. Classification of Malocclusion

Malocclusion can be classified according to three different spatial planes: sagittal, transverse and vertical. Malocclusion is also classified according to Angle's classification which are as followed (3):

Class I (neutral occlusion): The Change of tooth position in which there is a normal anteroposterior relationship between the upper and lower arches. The triangular ridge mesio-buccal cusp of the upper first permanent molar occludes in the mesio-buccal groove of the lower first permanent molar. Thus, a person who, having such molar

relationship, can be described as the Angle's Class I Malocclusion with one or more of the following characteristics: tooth rotation, median diastema, anterior crossbite, open bite, deep bite and/or dental arch atresia.

Class II (Disto-occlusion): a "distal relationship" of the lower arch in respect to the upper arch is termed as the Class II Malocclusion. In other words, the mesiobuccal groove of the upper first permanent molar occludes distal to the mesiobuccal cusp of the upper first permanent molar, where:

- **Division 1**: Distocclusion in which the upper incisors are in proclination.
- **Division 2**: Distocclusion in which the maxillary central incisors are almost in its anteroposterior normal position or with a mild retroclination, while the maxillary lateral incisors have a proclination.

Class III (mesio-occlusion): Malocclusion in which the lower arch is placed "mesial" to the upper arch. The mesiobuccal groove of the lower first permanent molar occludes in the mesial to the upper first permanent molar mesiobuccal cusp.

Criteria used for the Dental Aesthetic Index (DAI) (3)

Crowding in the incisal region: The crowding in the incisal region is the condition in which there is no space between the right and left canines for all four incisors to align in the normal occlusal relationship.

Spacing in the region of incisors: Regarding maxillary and mandibular arches, in the incisal region, there are available spaces between the right and left canines which exceed the necessary space to align all four incisors in normal alignment. If there are one or more interproximal spaces without interdental contacts, this is recorded as spacing.

Diastema: The space between the contact points of the mesial surfaces of maxillary central incisors were considered.

Anterior maxillary overjet: It is defined as the horizontal relationship between the maxillary and mandibular central and lateral incisors with the teeth in centric occlusion. The distance between the labial-incisal edge of most prominent upper incisal teeth and the labial incisal edge of lower central incisor was measured. When it is more than 2 mm, it is diagnosed as anterior maxillary overjet.

Anterior mandibular overjet: This is also called the reverse overjet. It is defined when a lower incisor presented with anterior protrusion when it compares to the opposite maxillary incisal teeth, or in cross bite.

2.2. Causes of Malocclusion

The etiology of malocclusion is based on two factors; hereditary and environmental (14). Many studies suggest that genetic factors contribute to malocclusion susceptibility. Moderate to high genetic proportions (more than 60%) have been shown for many dentofacial features such as, crowding, spacing, and Bolton type tooth size discrepancies. On the other hand, overbite (53%) and overjet (28%) show lesser heritability, in which it is highly susceptible to environmental factors (11).

Thus, Genetic factors exhibit their influence during the growth and development of the jaws leading to malocclusion (33). These influences can be combined with certain etiological factors, for example, oral bad habits such as thumb sucking habit, tongue thrusting habit, and oral respiration habit. Malocclusion is a

growth and development deviation, mainly of the muscles and alveolar bones during the phase of childhood, and may be due to the oral bad habits in early childhood (34).

When it comes to a thumb-sucking habit, the child sucks or places his or her thumb, between the maxillary and mandibular dental arches in which it causes the tongue to move downwards. The tongue is not an original position on the palate, limiting from developing transversely; furthermore, the position of the thumb pushing against the upper central incisors leads to their prominence. Children tend to develop an anterior open bite and posterior cross-bite due to a lack of palatal development (12). Posterior teeth may also extrude, caused by the lack of contact of upper and lower teeth due to the placement of the finger (7).

Lip or cheek sucking also affects the occlusion of upper and lower dentition and skeleto-facial development. In the case of patients with sucking of the lower lip, there is a muscular contraction of the lower orbicularis and mental with subsequent proclination of the upper central incisal teeth, retroclination of the lower central incisal teeth, which results the increased overjet. (13).

When it comes to oral respiration, it is due to nasal airway obstruction, for example, by adenoid or palatine tonsil hypertrophy, rhinitis, and turbinate hypertrophy. Patients with this condition are unable to breathe with nasal airway, so they inhale with the mouth which consequent causes dental and skeletal problems, such as anterior open bite, clockwise rotation of the mandible, prognathism and narrow palate (35).

2.3. Treatment and Prevention of malocclusion

Treatments of malocclusion can be divided into two options: with removable appliances and with fixed orthodontic treatment.

2.3.1. Removable Orthodontic Appliances

According to the different classifications of malocclusion, the uses of removable appliances are varied.

2.3.1.1. Class 1 Malocclusion

A class I malocclusion is a type of malocclusion in which there is no skeletal deformities. The relationship between the upper and lower jaws is essentially in a normal position and the molar relationship in the anteroposterior plane is Class I. Within this generally acceptable occlusal relationship, there may be some problems for which it is appropriate to use the appliance. The nature of the tooth displacement and whether the simple mechanics and movements offered by removable appliances greatly influence the application of the removable appliances. In this way, necessary corrective movements can be achieved.

Movement of incisors in the line of the arch is not necessary for this treatment but if the distance is small, simple tooth movement may be achieved. Closure of a median diastema may sometimes be necessary. In this case, appliances that are used to open space between the central incisors are Adam Clasps on right and left upper or lower first molars in order to achieve retention, base plates to provide normal palatal coverage, cantilever springs for the distal movement of both left and right lateral incisors.

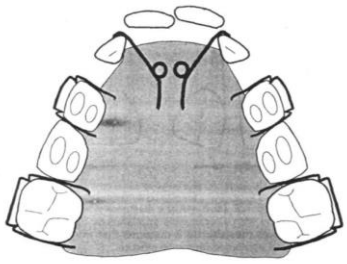

***Figure 2. A removable orthodontic appliance used for the treatment of Median Diastema* (36)**

In the case of a buccally erupted canine, the main problem of this case is the crowding of the maxillary teeth in the upper arch. The upper canines are usually buccally erupted which is not in the line of occlusion and a buccal canine retractor must often be utilized. This spring is able to move the canine not only palatally but also distally. Appliances that are utilized in this case are Adams' clasps on both sides of upper first molars and South-end clasp on distal surfaces of central incisors for the retention of the appliance, baseplate for palatal full coverage, self-supported buccal canine retractors (0.5 mm spring) supported in tubing with 0.5 mm internal diameter (as an active component).

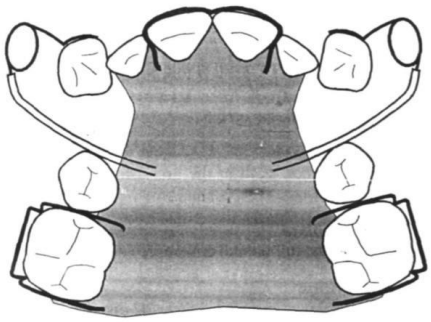

***Figure 3. Removable orthodontic appliance used for the treatment of bucally erupted canine* (36)**

2.3.1.2. Class II Malocclusion

In the case of anterior crowding in the upper jaw with Class II Division I malocclusion, the maxillary premolars need to be extracted because the upper canines require distal retraction into a class I relationship with the lower teeth when they are in an uncrowded position. Overbite reduction can be achieved at the same time with an anterior bite plane. Another appliance is then used for the reduction of the anterior overjet. In the same time, it will maintain the overbite reduction with an anterior bite plane and allowing the canines in their new position.

The ideal spring for distal retraction of the canines is the palatal finger spring, boxed and guarded (0.5 mm stainless steel wire). Clasps on the first molars are necessary for retention, together with a clasp on the incisal teeth. Overbite is reduced by a flat anterior bite plate. It is constructed to be just sufficiently deep to contact the lower incisal teeth evenly (Figure 3).

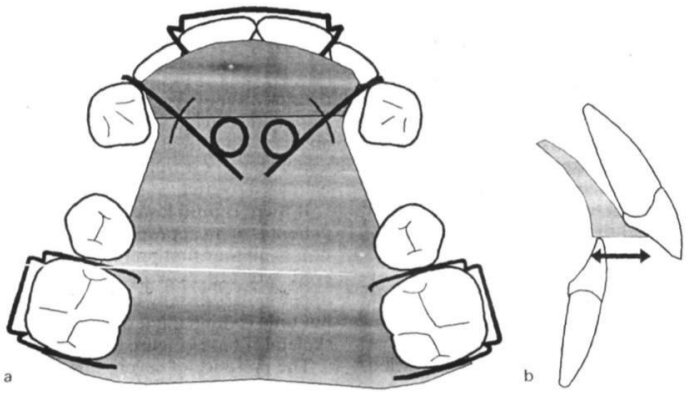

***Figure 4. (a) The use of palatal finger spring at upper canines, (b) the use of flat anterior bite plate for overbite reduction* (36)**

When the canines have been retracted into class I with the lower canines and the overbite has been relieved, overjet reduction can be started by utilizing a Roberts'

retractor. The appliance should involve stops mesial to the canines in order to prevent their forward relapse and an anterior bite plate which is sufficiently thick to maintain the existing overbite reduction. In order to permit overjet reduction, the acrylic must be trimmed on the palatal aspect of the fitting surface of the removable appliance by carrying out progressively during overjet reduction.

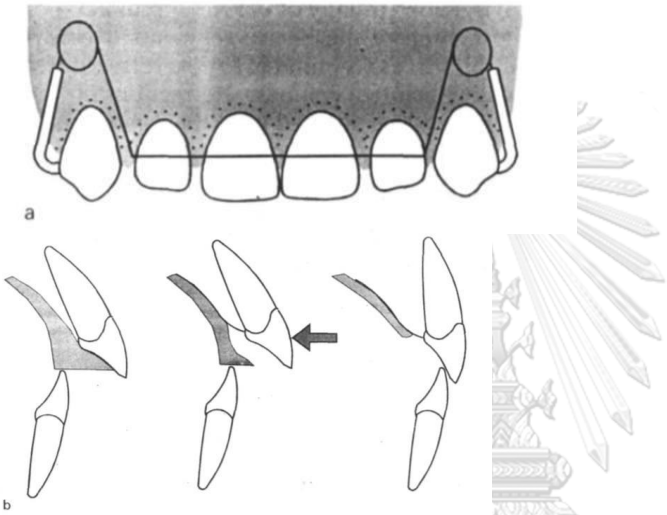

Figure 5. (a) The use of Robert's retractor in the upper incisors, (b) the overbite should be fully reduced before overjet rediction has begun. The fit surace of the bite plane should be trimmed progressively, allowing the overbite reducion.be required during this phase of treatment. (36)

When it comes to the mild cases, it is possible to retract the canines into the space and the incisors with a single appliance. In this appliance, palatal canine springs and a reverse loop labial bow is included in this construction of the appliance (Figure 5). Caution must be taken to activate only the palatal springs until the canines are appropriately placed in the normal position. During this stage, these springs can be made passive and the reverse loop labial bow can be activated. Because of these bows

are not flexible enough, many operators favor to divide the bow at the mid-line allowing it to be more flexible to reduce the overjet.

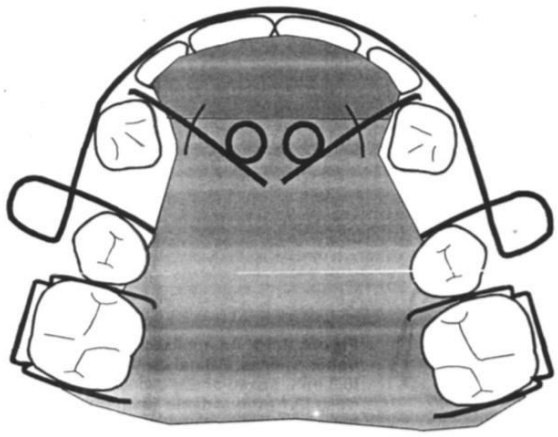

***Figure 6. The use of labial bow (0.7mm) and canine spring (0.5mm) for the canine reduction and overjet reduction* (36)**

A retainer with cribs on upper first molars and a 'U' loop labial bow is the most suitable to allow overjet reduction. The Roberts' retractor is not an ideal appliance for retention because it is too flexible and can, become distorted if it is used for a long period of time. When a reverse loop labial bow is being used for overjet reduction, this may be used for a retention phase.

Only a small proportion of Class II division 2 cases are responsive to removable appliance treatment. Where the overbite is extreme and has traumatic potential, fixed appliances is required to provide a satisfactory inter-incisal angle. Thus, if the overbite is increased yet not potentially traumatic and maxillary dental crowding is mild with an acceptable position of lower teeth then a class II division 2 malocclusion can be corrected by using a distal movement technique.

In cases with dental crowding with needed premolar extractions, not only in both arches but also the upper arch alone are not sound for the removable appliance treatment. Extra-oral support is required to achieve distal retraction of the buccal segments to a Class I relationship yet normally a full-time removable appliance will be provided, as overbite reduction is likely to be necessary and it is limited to achieve this with partial wear. Once the molar relationship is treated to a Class I, then distal movement of canines and alignment of the lateral incisors can be achieved. A 'U' loop labial bow is provided to align the lateral incisors yet only if a scanty amount of control of rotation can be resulted. In a patient during the puberty, some improvements in the inter-incisor angulation may be spotted as a result of some proclination of the upper incisors during the overbite reduction stage. The upper lateral incisors have an intrinsic tendency to relapse and long-term retention following alignment is necessary.

2.3.1.3. Class III Malocclusion

The objective of treatment for Class III Malocclusion is the correction of reverse overjet. During mixed dentition, one or two incisors in cross bite are related to upper arch crowding. In this case, upper incisors are needed to procline forward in order to get Class I relation. To construct the removable appliance for Class III malocclusion, the active component is double cantilever springs or cranked finger springs, which is used to be clasped to limit the displacing movement effect of the spring. The main advantage of using this spring is that it is simply manageable for the patient which allows retention to be improved by clasping the two central incisors.

Moreover, for retention, Adam clasps on right and left first molars and right and left central incisors are being used with a screw to drift the labial segment to the forward movement. Anchorage can be achieved by clasping the teeth. Baseplate Posterior bite planes are utilized to limit the occlusal contact in the incisal region by approximately 1 mm. A screw is used to split the baseplate as seen in Figure 6.

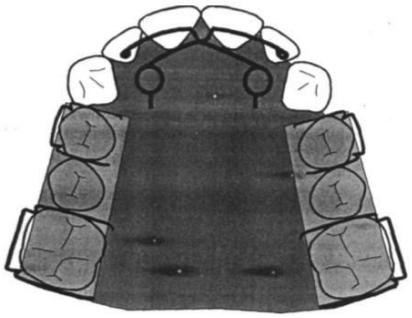

***Figure 7. An appliance which is used to pro-cline upper incisors to achieve Class I relation* (36)**

2.3.2. Fixed Orthodontic Appliance

Orthodontic treatment enables for the improvement of the patient's dento-facial appearances and provides a positive attitude throughout life. Moreover, it also gives confidence and social acceptance. It would not only lead to an acceptable esthetics such as beautiful smile yet also can make the teeth to achieve occlusion better each other so it improves the oral health. Fixed orthodontic treatment also protects the gum abnormalities, for example, gum recession, and dental trauma, carious cavities, gingivitis, periodontitis, and possible loss of teeth in some individuals. Orthodontic treatment could lower the incidence of the suffering among the people, that is, social embracement if early detection of the specific problem, diagnosis of the malocclusion and treatment can be provided at the right timing (30).

This can be done by creating population awareness about the causes and consequences of malocclusion. The present study is such an initiative to attain this goal.

2.4. Impact and Outcome of malocclusion

Although malocclusion is neither a disease nor a threat to life, there is still an obvious demand for orthodontic treatment. Furthermore, the treatment of malocclusion places a considerable financial burden on health care resources worldwide, when funded by public means. In an attempt to prioritize the treatment of malocclusion, various occlusal indices have been developed depended on the severity of malocclusion and the conceivable destruction, it may cause to oral health if left untreated. Therefore, it has long been recognized that if people seek and undergo orthodontic treatment not due to the anatomic deformities to prevent the destruction of oral mucosa within the oral cavity, yet because of the consequences of the esthetic appeal caused by malocclusion. However, malocclusion and orthodontic care have become an impact on a quality-of-life (QoL) issue.

The Health-related Quality of Life (HRQoL) described an individual's assessment of how the following factors affect his or her health: experience of having pain or discomfort, physical function, psychosocial concerns, for example, consideration of the self-appearance and self-esteem), and social functions, for instance, interactions with others. When these concerns emphasize on orofacial considerations, Oral Health–related Quality of Life (OHRQoL) is assessed.

The physical, social, and psychologic consequences of malocclusion have influenced on quality of life. Moreover, two decades ago, a number of specific Oral-

Health Related Quality of Life (OHRQoL) measures have been created to use in assessments of the impact of oral health status on quality of life and to assess the outcomes of oral health care intervention in terms of contribution to QoL. This is crucial to obtain an understanding of the importance of malocclusion and orthodontic care, and priority for orthodontic treatment within the health care spectrum (15).

2.5. Situation and Prevalence of Malocclusion

Oral Health is one of the determinants of the Quality of Life (QOL). The craniofacial complex is crucial to our daily routine activities. We can communicate, laugh, taste, kiss, touch, chew, swallow, and cry out in pain. It also prevents bacterial infections and accidental traumas. Oral infections, oral diseases, and oral anomalies can limit the daily routine activities in schools, work, and, social occasions. From this, the psychosocial impact of this disease leads to the diminishing of the Quality of Life (37).

In the primary dentition, Angle's Class 1 is the highest prevalence among other classes with 62.3% followed by Class II with 23.29% and Class III with 7.76%. Similarly, when it comes to mixed dentition, according to the measurement with the sagittal plane, Class I is also the most highly prevalent case with 54% followed by Class II (29%) and Class III (6%). In permanent dentition, same with primary and mixed dentition, Class I is also the highest prevalence with 55.5% followed by Class II with (24.7%) and Class III with (10.7%). (7) Furthermore, other types of malocclusion such as scissor bite and crowding increased from primary dentition to permanent dentition. Scissor bite increased from 0.4 to 5% and crowding from 16 to 39%.

One out of two children is affected by malocclusion and it has become the public health concern as it is a highly prevalent condition worldwide. The global prevalence of malocclusion is 56% with no difference in gender. When it comes to the overall distribution among the continents around the world, the highest prevalence of malocclusion is marked in Africa at 81%, followed by Europe at 71%, America at 53%, and Asia at 48%. From these prevalence data, malocclusion becomes not only an oral health problem but also an economic burden that impacts the family of children with malocclusion and dental health public services (7).

The nationwide pooled prevalence of malocclusion in India showed 35.4% with 36.2% in males and 31.98% in females. The urban population marked more prevalent malocclusion than in rural population with 36.2% and 32.78% respectively. Angle's Class I malocclusion varies from 66.7% in North India to 49.2% in South India. According to age group, it showed that about 91.6% in 5-9 years age group and 27.7% in 10-13 years age group in Central India. When it comes to Class II malocclusion, the prevalence ranges from 1.9% in North India to 4.6% in South India with 6% in 5-9 year age group and 14.6% in 10-13 years age group in Central India. With the same resemblance, Class III malocclusion ranges from 1.4% in North India to 0.3% in South India with 3.4% in 10-13 years age group in Central India. It also exhibited different evidences from Caucasians with a variation of 0.8 to 4.0% and the Chinese population where it is very high in contrast with the Indian population with 12-13% (2, 7).

In China, the overall prevalence of malocclusion in school children aged between 6-12 years old is 47.92% with the slight difference in gender. Regarding

malocclusion, the highest prevalence exhibits Class I malocclusion at 30.07%, and then, Class II malocclusion at 9.91%, and the lowest prevalence was Class III malocclusion at 4.76%. Among all the provinces, Qinghai Province had the most prevalence rate of 75.43%. On the other hand, Hubei Province had the lowest prevalence rate at 30.07%. When it comes to regions, North China has the highest prevalence rate of 57.26%, followed by Southwest China at 53.49%, Northwest China at 2.61%, Northeast China at 48.72%, East China at 45.65%, and South Central China at 37.11% (9).

Among Saudi Arabians, dental crowding was exhibited in 47.2%, while spacing was only marked at 27.2%. According to Angle's classification, 52.8% of the population showed Angle's Class 1 malocclusion, followed by Angle's Class II malocclusion at 31.8% and Angle's Class III malocclusion at 15.4%. Furthermore, 49.4% of the population did not demand any treatment, while 29.6% of the population needed a borderline treatment and 21.0% needed a definitive treatment (10).

2.6. Parental Knowledge, Attitude, Barriers and Practice of Children's Malocclusion

Esthetical awareness has become a trend. By social media, the fact that a shred of misperception about orthodontic treatment still can be seen in the populations. The patients' cooperation and the outcome of the treatment rely markedly on the patient's knowledge and attitude towards the orthodontics. However, the orthodontists need to firstly know, the patients' attitude as well as their knowledge about their dental problems and the solutions. So, not only the treatment planning but also the treatment shall be definitely better arranged and managed, without any obstacles (38).

Treatment timing largely depends in the success rate of the orthodontic treatment in children. Early treatment can lower the traumatic risk of dental injury especially anterior teeth in children. Malocclusion in primary or mixed dentition could be treated by a simple interceptive treatment during the puberty growth spurt, when combined with the benefits of their growth potential, lowers the severity of malocclusion and the need for further complex treatment when they become aged. Parents are more likely to detect the facial and occlusal defects in children more than dentists (22). So, seeking orthodontic treatment is influenced by perceived concerns, desire, and motivations by parents' despite of this event is for a child. As children and adolescents are still dependent on their parents and primary caregivers in a financial and decisive way, parents are the ones who took the final decision whether to receive the orthodontic treatment or not (25).

In giving access to orthodontic treatment, there are certain types of obstacles which limit the availability of orthodontic treatment. The previous study suggested that most frequent barrier to access orthodontic treatment is cost of the treatment followed by long treatment duration and pain (39).

Many psychological, social and cultural factors can influence the person to decide whether the person is aware of malocclusion and the demand of the correction of it. Moreover, children rely on parents financially and decisively (24). In order to promote oral health and oral functions such as mastication and prevention of social stigma against malocclusion, parents consider orthodontic treatment for their children. In the previous studies, it has shown that parents who received orthodontic treatment in their lifetime have more interest to undergo orthodontic treatment in children or

more concern to visit orthodontists regularly and have consultation for their children (23). However, the determination of receiving orthodontic treatment depends mainly on parents' knowledge, attitudes and practice to early detection of malocclusion and early access to orthodontic treatment for their children are mandatory and are important value (23, 24).

Chapter 3

Methodology

3.1. Study Design

This study design is a cross-sectional study focusing on the knowledge, attitude, barriers and practice of parents on malocclusion in children living in Yangon, Myanmar.

3.2. Study Area

The study was carried out in townships of Municipal areas of Yangon at which the majority of the union population of Myanmar currently resides in this city. (20) According to the latest update by Yangon City Development Committee (YCDC), Yangon is composed of 10 districts, namely, Ahlone, Botahtaung, Dagon Myothit, Insein, Kamayut, Kyauktada, Mayangon, Mingaladon, Thingangyun and Twaytay (40).

Table 6. List of districts and townships in Yangon, Myanmar

Districts	**Townships**
I. Ahlone	1. Ahlone 2. Kyee Myin Dine 3. Sanchaung
II. Botahtaung	4. Botahtaung 5. Dawbon 6. Mingalar Taung Nyunt

	7. Pazundaung 8. Thaketa
III. Dagon Myothit	9. South Dagon 10. North Dagon 11. East Dagon 12. Dagon Seikkan
IV. Insein	13. Insein 14. Hlaing Tharyar (East) 15. Hlaing Tharyar (West)
V. Kamaryut	16. Kamaryut 17. Bahan
VI. Kyaukdata	18. Kyaunktada 19. Pabedan 20. Latha 21. Lanmadaw 22. Dagon
VII. Mayangone	23. Mayangone 24. Hlaing 25. North Okkalapa
VIII. Mingalardon	26. Mingalardon 27. Shwe Pyi Thar
IX. Thingangyun	28. Thingangyun 29. South Okkalapa

	30. Yankin 31. Tarmwe
X. Twantay	32. Seikkyi Kha Naung To 33. Dala

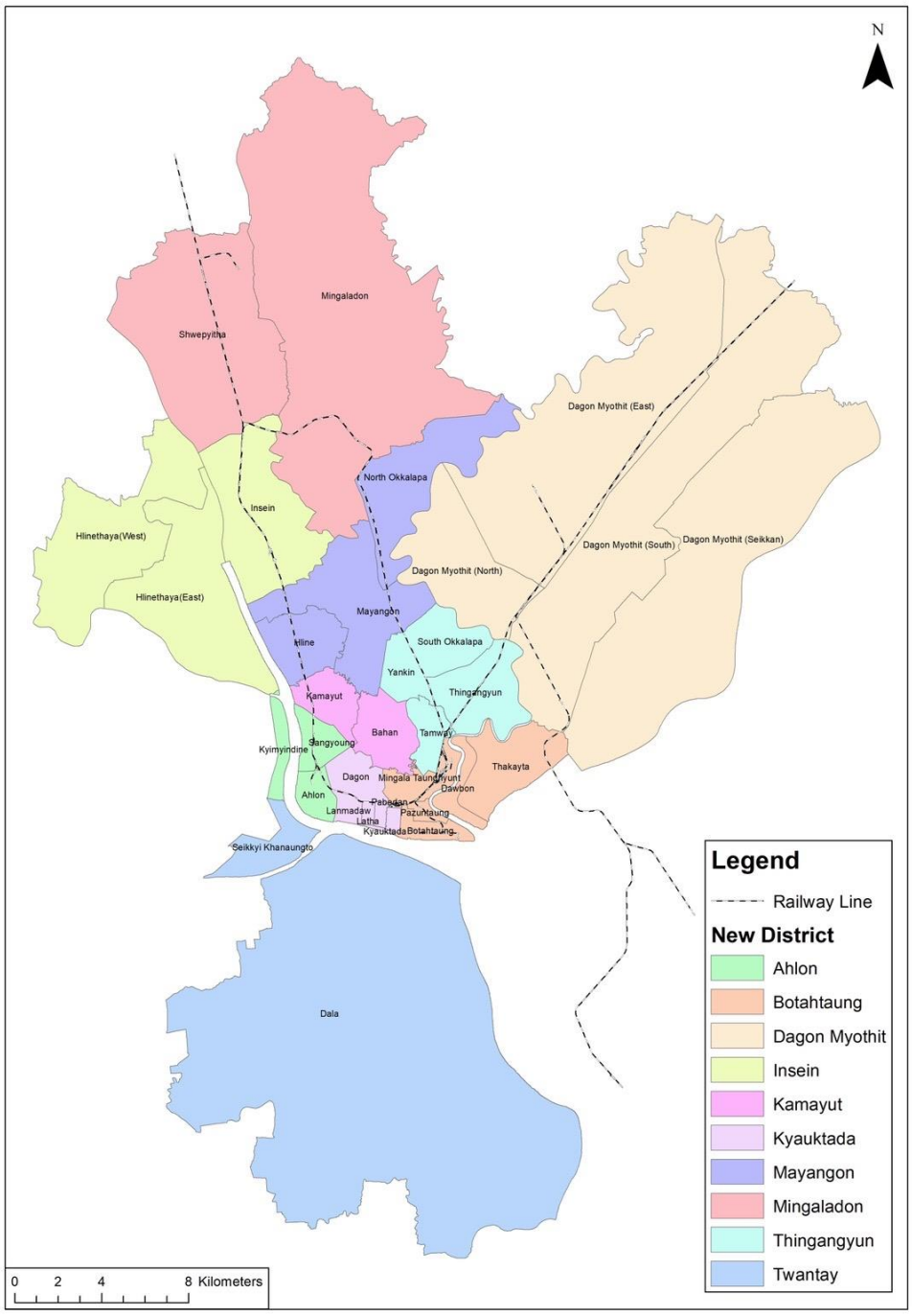

***Figure 8. Map of Yangon showing 10 districts* (40)**

3.3 Study Population

In this study, the study population was targeted to parents of 20 to 50 years of age who had children aged between 6 to 12 years and was residing in Yangon, Myanmar during the study period.

3.4. Sample Size

Due to the limited access to previous similar studies with unknown population, Cochran's sample size formula is suitable to calculate the sample size for this research study.

According to Cochran's sample size formula: $n = \frac{Z_{\alpha/2}^2 (p*q)}{e^2}$

At 95% CI,

n = number of participants

$Z_{\alpha/2} = 1.96$

p = estimated proportion of population = 0.35

q = 1-p = 1 – 0.35 = 0.65

e = margin of error 5% = 0.05

Therefore, $n = \frac{1.96^2 (0.35*0.65)}{0.05^2}$

n = 350

After summation of 10% error to this, there were 385 participants from Yangon, Myanmar. Since there is no pooled nationwide prevalence of malocclusion

in Children or parental assessment of knowledge, attitude, and practice regarding malocclusion in children in Myanmar, prevalence of malocclusion in children of India (35.4%) was used to calculate sample size calculation of this study.

3.5. Sampling Technique

The sampling technique was convenient sampling.

3.5.1. Inclusion Criteria

1. Parents' age must be between 20 to 50 years.
2. Parents of children 6-12 years of age.
3. The Place of residence must be in Yangon, Myanmar at least 6 months.
4. The parents were able to understand Myanmar language.
5. The Parents must be willing to participate.
6. The parents could access to Google Form Survey.

3.5.2. Exclusion criteria

1. Parents who were not living with children
2. Parents who were dentists, dental nurses, and dental technicians
3. Parents who did not complete all survey questionnaires

3.6. Measurement Tools

3.6.1. Screening Questionnaires

Prior to any questionnaires, there were 5 screening questions in order to meet the inclusion criteria for this study. If the participants were eligible for this study, then, he or she could answer the questionnaires. The section briefly explained about the researcher and the title of the study. Participants were being reassured that their information was kept confidential and was only utilized for the research purpose. Moreover, in this part, the participants clarified that answering the questionnaires could be discontinued anytime if the participants feel uncomfortable.

3.6.2. Survey Questionnaires

Based on the previous studies of parental knowledge, attitude, barrier, and practice of malocclusion, a structural questionnaire is adapted. This structural questionnaire has 5 sections for independent variables and an outcome variable (Parental Practice of Malocclusion) is the dependent variable.

For independent variable,

Part 1 – Individual Characteristics of parents include age, sex, occupation, education level, monthly income (individual and household), history of previous orthodontic treatment, history of malocclusion and number of offspring.

Part 2 - Individual characteristics of children include age, sex, level of education, history of oral habits, history of malocclusion and history of previous orthodontic treatment.

Part 3 – Parental knowledge regarding malocclusion of children includes knowledge on causes of malocclusion (genetics, bad oral habits, diet due to high sugar consumption, and early tooth loss due to carious lesions), knowledge on the related oral health problems (esthetic, social and functional problems), knowledge on risk factors of malocclusion (traumatic injury, gingivitis and periodontitis, and early tooth loss due to caries), and knowledge on prevention and treatment of malocclusion (changing diet habits. serial extraction and avoidance of oral bad habits). There will be 14 items in this part and in these questionnaires, the correct answer is "Yes" only and scored as "1". "I Don't Know" and "No" are the wrong answer so it is scored as "0". In our study, the Cronbach's alpha internal consistency coefficient was 0.876.

Part 4 – Parental attitude regarding malocclusion of children includes the attitude towards the oral habits (avoidance of the oral habits and the application of removable appliances in order to prevent those habits) and attitude towards prevention and treatments of malocclusion (routine dental check-ups, treatment timing, treatment options). There are 5 items in this part. According to the scoring for the questionnaires of attitude, "strongly agree" and "agree" are considered to be the positive attitude and it is scored as "1". "Neutral", "Disagree" and "Strongly Disagree" are considered to be the negative attitude and it is scored as "0". In our study, the Cronbach's alpha internal consistency coefficient was 0.724.

Part 5 – Barriers by parents towards the orthodontic treatment and it includes treatment cost, long treatment duration, pain, insufficient time to attend the follow-up, underlying medical Conditions, peer advice (Family, Friends, Dentist, etc.), temporomandibular Joint (TMJ) problem, and long waiting list. the researcher only

wants to assess the presence of the barriers to treatment and care of malocclusion by the parents. Therefore, there is neither correct nor incorrect answer. In our study, the Cronbach's alpha internal consistency coefficient was 0.7.

For the dependent variable,

Part 6 – The practice of parents is the dependent variable. There are 11 items and the questionnaires for parental practice of malocclusion in children are adapted from the similar studies form the past. The questionnaires for routine observation of the malocclusion in children by their parents and the treatment of malocclusion in children is adapted from the previous study. (25) Lastly for the questionnaires of the prevention of malocclusion in children are adapted from the previous research paper. (30) From the answers of questionnaires, "Yes" is considered to be a good practice and it is scored as "1" and on the other hand, "No" is considered to be a bad practice and it is scored as "0". The total score for this section is 11. The Cronbach's alpha internal consistency coefficient was 0.786.

3.7. Validity and Reliability

3.7.1. Validity Test

The research questionnaire was adapted from the questionnaires of the previous studies. These adapted questionnaires were reviewed by the three experts to access the questionnaires' validity and content utilizing the Item Congruence Index (IOC).

There were three characteristics which determine IOC scoring:

- ✓ A score of -1 showed that the questionnaire's phrasing and meaning do not correlate or align with the conceptual framework and the operational definitions.
- ✓ A score of 0 indicated that the questionnaire's phrasing and meaning correlate or align with the operational definition and the conceptual framework but it is still not clear.
- ✓ A score of 1 showed that the questionnaire's phrasing, wording and meaning all align with the conceptual framework and the operational definitions.

The questions were modified when the score of 0.5 had not been met in each item of questionnaires. In this study, the average IOC score obtained from the scores by 3 experts: one from the public health field, one from the dental general practitioner and one from the orthodontic field. Using IOC scores to check content validity, the average IOC score for 36 items is 0.975, which is more than 0.5.

3.7.2. Reliability Test

A pilot test was done on 15% of the targeted population, including 60 participants meeting the inclusion criteria and residing in Mandalay, Nay-pyi-taw, Taung-gyi at which those cities were culturally and socio-demographically appropriate with the study area such as excluding those living in Yangon. The pilot test used Cronbach's alpha coefficient in order to provide the reliability of the questionnaires. The reliability test for parental knowledge, attitude, barriers and parental practice regarding children's malocclusion was 0.876, 0.724, 0.700, and 0.786 respectively. Therefore, the results were equal to or greater than 0.7.

3.8. Ethical Consideration

Ethical approval [COA 216/66] for this study was obtained from the Ethical Committee for Research Involving Human Subjects in the Health Science Group of Chulalongkorn University before the data collection. The respondents received a clear explanation of consent prior to answer the questionnaire from the Google Form. This study mainly prioritized participants' privacy. Google form did not record participants' email addresses, and names and detailed information of the participants were not necessary to answer within the questionnaire. Google form only provided the unique ID number, which will be used on all study-related documents. However, not only the researcher but also everyone could not know participants' information. The results were published and presented without revealing their identity. Moreover, respondents took part with their own consent whether they wished to proceed and complete the Google Form until the end. They had their own rights to answer it without further notice. When it came to the disbursement of the gifts, the researcher asked each respondent to provide their contact number if they wished at the end of the Google Form. The equivalent amount of 50 baht was added to their balance as a mobile data allowance in order to express a gesture of appreciation for their time and effort in participating. Phone number was used only for this purpose and not for any other purposes. The results and findings from this Google Form was used only for research purposes and the contact numbers and data was completely deleted after three years.

3.9. Data collection method

This research employed self-administered questionnaire-type Google Form survey with the sampling technique of convenient sampling to gather the data. The

online survey was approximately 20-30 minutes long. In order to get the adequate amount of sample, the survey was distributed through social medias such as Facebook. Moreover, the researcher distributed this survey to the dental clinics at 10 districts of Yangon, Myanmar via Messenger, Viber, Telegram and Line application. The data was collected after the ethical approval on 24th October 2023.

3.10. Data Analysis

Data obtained from the data collection was entered into SPSS version 28.0 and they were used for the data analysis. After data collection, the researcher checked and did the data cleansing. The questionnaires were coded before entering the data, and double entry was applied to enter the data in order to ensure quality.

3.10.1. Description of the variables

The independent variables consist of four groups of categories: individual characteristics of parents, individual characteristics of children, parental knowledge regarding malocclusion in children, parental attitude towards malocclusion in children and barriers to access the treatment and prevention of malocclusion.

Table 7. Recoding of the Independent Variables

Individual Characteristics of Parents		
No	**Name of the Variables**	**Categories**
1	Age	Completed age of the participant
2	Sex	The categorical variable with 2 attributes 1 –Male (Biological Father – 1.1. Yes or 1.2. No) 2 – Female (Biological Mother – 2.1. Yes or

		2.2. No)
3	Occupation	The categorical variable with 7 attributes 1 – Unemployed 2 – Student 3 – Government Officer 4 – Business Owner 5 – Company Employee 6 – Freelancer 7 – Others
4	Education Level	The categorical variable with 5 attributes 1 – Middle School or less 2 – High School Level 3 - Undergraduate Level 4 – Graduate Level 5 - Postgraduate Level
5	Monthly Income (Individual)	The categorical variable with 5 attributes 1 - < 144,000 MMK 2 - 144,000 – 300,000 MMK 3 - 300,001 – 500,000 MMK 4 - 500,001 – 1,000,000 MMK 5 - > 1,000,000 MMK
6	Monthly Income (Household)	The categorical variable with 5 attributes 1 - < 288,000 MMK 2 - 288,001 – 600,000 MMK 3 - 600,001 – 1,000,000 MMK 4 - 1,000,000 – 2,000,000 MMK

		5 - More than 2,000,000 MMK
7	History of previous orthodontic treatment such as braces, removable appliances	The categorical variable with 2 attributes 1 – Yes 2 - No
8	History of malocclusion	The categorical variable with 3 attributes 0 – No 1 - Yes
9	Number of offspring	The number of children by the participant
Individual Characteristics of Children		
No	Names of the Variables	Categories
1	Age	Age in completed years of children
2	Sex	The categorical variable with 2 attributes 1 –Male 2 – Female
3	Level of Education	The categorical variable with 2 attributes 1 - Primary School 2 - Secondary School
4	History of Oral Habit	The categorical variable with 4 attributes 1 – Thumb sucking 2 - Mouth Breathing 3 - Tongue Thrusting 4 – I Don't Know
5	History of malocclusion	The categorical variable with 2 attributes 1 – Yes

		0 – No 2 – I Don't Know
6	History of Previous Orthodontic Treatment	The categorical variable with 2 attributes 1 – Yes 0 - No

Table 8. Parental Knowledge of Malocclusion in Children

No	**Name of the variables**	**Categories**
1	Knowledge about causes of malocclusion in children i. Genetic ii. Oral Bad Habit (Thumb sucking, Mouth breathing, Tongue thrusting) iii. Diet (Eating too much sugars) iv. Tooth Loss (Due to caries)	The categorical variables each with 3 attributes 0 – No 1 – Yes 2 – I don't know
2	Knowledge about oral health problems of Malocclusion in children i. Esthetic problem ii. Social problem (school bully on facial appearance) iii. Functional problem (Masticatory problem)	The categorical variables each with 3 attributes 0 – No 1 – Yes 2 – I don't know
3	Knowledge about risk factors of malocclusion in children	The categorical variables each with 3 attributes

	i. Traumatic risk ii. Gingivitis/ Periodontitis iii. Early Tooth Loss due to caries	0 – No 1 – Yes 2 – I don't know
4	Knowledge about prevention of malocclusion i. Changing diet habits ii. Serial extraction iii. Avoiding oral bad habits iv. I will take my child to perform orthodontic treatment only if he or she would not pass puberty period.	The categorical variables each with 3 attributes 0 – No 1 – Yes 2 – I don't know

Table 9. Parental Attitude Towards Malocclusion in Children

No	**Name of the Variables**	**Categories**
1.	Attitude towards oral habits in Children which can consequently lead to malocclusion i. If my children have oral respiration, I will take them to the dentist to evaluate dento-facial abnormalities ii. Due to the oral habits, for example, thumb sucking, tongue thrusting), I take my children to	The categorical variable each with 5 attributes 1 - Strongly agree 2 - Agree 3 - Neutral 4 - Disagree 5 - Strongly disagree

	the dental clinic as soon as possible to prevent dento-facial problems.	
2.	Attitude towards treatments and prevention of malocclusion in children i) It is necessary to take the child for regular dental visits. ii) To begin orthodontic treatment for our children, we wait until their wisdom teeth erupt. iii) If my child has mandibular deformities, I will wait until he or she becomes an adult. After that, we try for surgical intervention. iv) If my child needs orthodontic management, I will do that even if he or she resists. v) To begin orthodontic management, I will wait until all his or her permanent teeth erupt completely.	The categorical variable each with 5 attributes 1 - Strongly agree 2 - Agree 3 - Neutral 4 - Disagree 5 – Strongly disagree

Table 10. Barriers Towards Treatment of Malocclusion

No	Name of the Variables	Categories
1	What is the Top Barrier to Treatment and Care of Malocclusion in Children? 1 - Affordability 2 - Accessibility 3 - Length of treatment 4 - Uncomfortable appearance 5 - Pain 6 - Required oral health maintenance	The categorical variable each with 2 attributes 1- Yes 0 - No

Table 11 Parental Practice regarding Malocclusion in Children

No	Name of the Variables	Categories
1.	Parental practice of routine observation of malocclusion in children. i. I regularly notice the alignment of my child's teeth ii. I know if my child has jaw problem, for example, prominence of lower jaw iii. I observe some oral bad habits in my children, for example, thumb sucking, tongue thrusting, mouth breathing	The categorical variables each with 3 attributes 0 – No 1 – Yes

2.	Parental practice of treatment of malocclusion in children. i. I always take my children to visit the dentist at least once a year ii. Based on the professional treatment need advice, if my children need orthodontic treatment, I allow to do orthodontic treatment for my children only if he or she is willing to do. iii. I will start orthodontic treatment of my child if my children have not passed puberty yet.	The categorical variables each with 3 attributes 0 – No 1 – Yes
3.	Parental practice on prevention of malocclusion in children i. Changing diet habits (for example, less sugar intake) ii. Prevention of early loss of teeth iii. Avoiding oral bad habits iv. Use of removable orthodontic appliances (for example, use of space maintainer to prevent the mesial drift of first molars) v. Timely treatment of	The categorical variables each with 3 attributes 0 – No 1 – Yes

	malocclusion like serial extraction	

3.10.2. Descriptive Statistics

According to descriptive statistics, frequency was reported with percentage for categorical variables. For continuous variables, with regards to data distribution, mean (standard deviation) for data with normal distribution and median (interquartile range) for data with no normal distribution.

3.10.3. Inferential Statistics

In all statistical analyses, SPSS version 28 was utilized in this study. To compare the categorical variables, the ANOVA test was used. Next, simple and multiple linear regression were used to find the association between independent variables and dependent variables with a 95% Confidence Interval (95% CI).

Chapter 4

Results

The objective of this study is to study the knowledge, attitude, barriers and practice of parents on malocclusion in children living in Yangon, Myanmar. Then, the researcher investigates the association between parents' individual characteristics, levels of knowledge, attitude, barriers and practice regrading malocclusion in children. In this study, the number of responses received was 428 participants. After data cleansing according to the exclusion criteria, the number of parents participated is 388.

In this chapter, the results can be divided into two parts. The first part is the descriptive findings of the individual factors including age, sex, biological parents or not, educational level, occupation, status of employment, monthly household income, history of previous orthodontic treatment and malocclusion. Furthermore, in this part, the parental knowledge, attitude, and practice regarding children's malocclusion and barriers to treatment and care of children's malocclusion by their parents are described. The second part is the inferential statistics using the ANOVA test to compare the means, simple linear regression and multiple linear regression to find the association between the independent and dependent variables included in this research. The independent variables consist of individual factors of both parents and children, parental knowledge and attitude regarding Children's malocclusion and the barriers to treatment and care of malocclusion by the parents. The dependent variable is the parental practice regarding children's malocclusion.

4.1. Descriptive Findings

4.1.1. Socio-demographic Characteristics of the Participants

Table 12 describes the demographic characteristics of the participating parents. The average age of the parents (Mean± Standard Deviation) is 36.33 ± 6.06 years with a range of 21 – 50 years. Most of the participants were between 31 – 40 years (52.6%). Regarding sex, most of the respondents (55.7%) identified as female (mothers) while 44.3% identified as male (fathers). Among them, 95.1% of the respondents identified themselves as biological parents while only the minority (4.9%) identified themselves as non-biological parents. In the level of education, 67.3% of the respondents are the graduate levels followed by undergraduate level with 11.6%, high school level with 11.3%, middle school or less level with 5.7% and post-graduate level with 4.1%.

Regards to employment, it is divided into status of employment and if the respondents were employed, there is another category for the occupation. According to status of employment, 77.8% of the respondents were employed while the rest (22.2%) were unemployed. Among the employed respondents, there was an almost equal distribution of business owner (29.4%) and company employee (28.4%), followed by government officers (14.7%), freelancer (3.1%), non-government officers including (pastors, employees from non-government organizations such as UN), and students (0.8%).

When it comes to the monthly income, it is divided into monthly individual income and monthly household income. Regards to monthly individual income, 46.9% of the respondents earned 300,001 to 1,000,000 MMK monthly and 41.5% of

the population earned less than 300,00 MMK. Only 11.3% earned more than 1,000,000 MMK. The monthly household income includes income from both of the parents. Among them, almost half of the participants earned less than 600,000 MMK followed by 600,000 – 2,000,000 MMK with 39.2% and more than 2,000,000 MMK with 11.3%. In the case of history of malocclusion, a nearly equal percentage can be seen as 51.5% of the participants identified themselves has having malocclusion while 48.5% identified themselves as not having malocclusion which is accessed by the dentists and orthodontists. According to history of previous orthodontic treatment, on one hand, 77.6% of the respondents have not received any kinds of treatment and care of malocclusion (orthodontic treatments), and on the other hand, only 22.4% of the respondent parents have received orthodontic treatments at least once in a lifetime.

Table 12 Socio-demographic Characteristics of the participants

(n= 388)

Variables	**Frequency (%)**	
Sex		
Male (Father)	172	(44.3)
Female (Mother)	216	(55.7)
Biological Parents		
Yes	369	(95.1)
No	19	(4.9)
Age group		
20 - 30 years	89	(22.9)
31 - 40 years	205	(52.6)
41 - 50 years	91	(23.5)

Variables	Frequency (%)	
Minimum - Maximum		21 - 50
Mean ± SD		36.33 ± 6.06
Education Level		
Middle School or Less	22	(5.7)
High School	44	(11.3)
Undergraduate Level	45	(11.6)
Graduate Level	261	(67.3)
Post-graduate level	16	(4.1)
Status of Employment		
Unemployed	86	(22.2)
Employed	302	(77.8)
Occupation		
Unemployed	86	(22.2)
Student	3	(0.8)
Government Officer	57	(14.7)
Business Owner	114	(29.4)
Company Employee	110	(28.4)
Freelancer	12	(3.1)
Non-government officers	6	(1.5)
Monthly Individual Income		
<300,000 MMK	161	(41.5)
300,001 – 1,000,000 MMK	182	(46.9)
>1,000,000 MMK	45	(11.6)
Monthly Household Income		
< 600,000 MMK	192	(49.5)

Variables	Frequency (%)	
600,001 - 2,000,000 MMK	152	(39.2)
> 2,000,000 MMK	44	(11.3)
History of malocclusion		
No	188	(48.5)
Yes	200	(51.5)
History of previous orthodontic treatment		
No	301	(77.6)
Yes	87	(22.4)

4.1.2. Parental Knowledge regarding Children's Malocclusion

In this section, it is divided into 4 parts: Causes of Malocclusion with 4 sub-parts, Oral Health Problems of Malocclusion with 3 sub-parts, Risk factors of Malocclusion with 3 sub-parts and Prevention of Malocclusion with 4 sub-types as shown in Table 13.

According to the causes of malocclusion, the majority of the parents (55.4%) did not know or think that malocclusion is the inherited condition while 44.6% of the respondents answered correctly to this question. In other sub-parts such as oral bad habits, diet, and tooth loss, the majority of the participants answered correctly with 59.3%, 72.4%, and 82% respectively.

In the part of oral health problems, most of the respondents answered correctly to the questionnaires. Almost three-fourth of the participants (74%) knew that malocclusion can lead to esthetic problem while only 26% did not know this problem is not related to malocclusion. There was no major difference in distribution of social

problems in which 53.1% of the participants knew malocclusion can lead to social problems like school bully while 46.9% of the participants did not know or think that malocclusion can cause social problems. Regarding functional problems, nearly two-third (65.7%) of the participating parents answered correctly, yet, 34.3% of the respondents answered wrongly.

The majority of the respondents answered correctly to the questionnaires in accordance of preventive measures of malocclusion. 80.4% of the respondents answered correctly that changing diet habits such reducing sugar intake can prevent the children's malocclusion while only 19.4% of the respondents showed that they answered wrongly. Nearly four-fifth (79.4%) of the responding parents thought that avoiding oral bad habits can prevent the malocclusion while 20.6% of the respondents answered the wrong answer in this sub-part. Last but not least for this section of parental knowledge, 68.6% of the parents will start treatment of malocclusion, for example, orthodontic treatment, before the puberty period which can be considered as the good knowledge while 31.4% showed the poor knowledge in this question.

Table 13 Parental Knowledge on Children's Malocclusion

Questions	Frequency (%)			
	Correct Answer		Incorrect Answer	
1) Knowledge about Causes of Malocclusion	173	(44.6)	215	(55.4)
i) Genetic				
ii) Oral Bad Habits	230	(59.3)	158	(40.7)
iii) Diet	281	(72.4)	107	(27.6)
iv) Tooth Loss	318	(82.0)	70	(18.0)

Questions	Frequency (%)			
	Correct Answer		Incorrect Answer	
2) Knowledge of the respondents about Oral Health Problems of Malocclusion				
i) Esthetic Problem like sticky-out tooth	287	(74.0)	101	(26.0)
ii) Social Problems like school bully on facial appearance	206	(53.1)	182	(46.9)
iii) Functional Problem like chewing problem	255	(65.7)	133	(34.3)
3) Knowledge of the respondents about Risk Factors of Malocclusion				
i) Traumatic Risk	186	(47.9)	202	(52.1)
ii) Gingivitis/ Periodontitis	258	(66.5)	130	(33.5)
iii) Early Tooth Loss due to caries	316	(81.4)	72	(18.6)
4) Knowledge of the respondents about Prevention of Malocclusion				
i) Changing Diet Habits	312	(80.4)	76	(19.6)
ii) Serial Extraction	216	(55.7)	172	(44.3)
iii) Avoiding Oral Bad Habits	308	(79.4)	80	(20.6)
iv) I will take my child to perform orthodontic treatment only if he or she would not pass puberty period.	266	(68.6)	122	(31.4)

4.1.3. Parental attitude on children's malocclusion

In this section, the parental attitude is divided into the attitude towards the oral habits which leads to the malocclusion and attitude towards the treatment and prevention of malocclusion.

In the first part of table 14, when it comes to the oral habits, 17.5% of the respondents strongly agrees and 56.2% of them agrees to take their children to the dentist to evaluate dentofacial abnormalities if they found out oral bad habits such as thumb sucking habit in their children showing that nearly three quarters of the respondents (73.7%) had positive attitudes. On the other hand, 16%, 8.5% and 1.8% of the respondents felt neutral, disagreed and strongly disagreed respectively to this given statement. Similarly, to the first statement, 16.8% and 55.7% of the participants strongly agreed and agreed respectively to take their children to the dental clinics to prevent the oral bad habits and dentofacial problems in which it shows the nearly 75% of the respondents had positive attitude towards the oral bad habits.

Secondly, according to the treatment and prevention of the children's malocclusion, 24% of the respondents positively agreed and 58.2% of the respondents agreed respectively that children must be taken to dental clinics regularly once a year for check-ups. In this part only a minority of the respondents had a negative attitude in which, only 9% of the respondents felt neutral, 8.2% and 0.5% of the respondents disagreed and strongly disagreed to the given statement. Regarding orthodontic treatment, parents had positive attitude with 69.8% cumulatively that they will not wait for the wisdom teeth to erupt if the orthodontic treatment is necessary to be provided in children with malocclusion. Oppositely, cumulative value of 30.1% of the

parents showed negative attitude towards this case in which they will wait for the orthodontic treatment until all the wisdom teeth erupt. Last but not least, in accordance to the surgical intervention, nearly half of the participants (49%) were being neutral while the second majority (cumulative value of 37.9%) of the samples showed the positive attitude in which they will wait for the children to get older and then the surgical intervention starts. On the other hand, only 10.8% disagreed and 2.3% strongly disagreed to this given statement as shown in the table 16.

Table 14 Parental attitude on children's malocclusion

Questions	Frequency (%)				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I. Parental Attitude towards oral bad habits in Children					
i) If my children have thumb sucking habit, I will take them to the dentist to evaluate dentofacial abnormalities.	68 (17.5)	218 (56.2)	62 (16.0)	33 (8.5)	7 (1.8)
ii) Due to the oral habits, for example, thumb sucking, tongue thrusting), I take my children to the dental					

Questions	Frequency (%)									
	Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
clinic as soon as possible to prevent dentofacial problems.	65	(16.8)	216	(55.7)	67	(17.3)	33	(8.5)	7	(1.8)
II. Parental Attitude towards treatment and prevention of Children's malocclusion										
i) It is necessary to take the child for regular dental visits once a year.	93	(24.0)	226	(58.2)	35	(9.0)	32	(8.2)	2	(0.5)
ii) To begin orthodontic treatment for our children, we will not wait until their wisdom teeth erupt.	68	(17.5)	203	(52.3)	92	(23.7)	23	(5.9)	2	(0.5)
iii) If my child has mandibular deformities, I will wait til he or she becomes an adult. After that, we try for surgical	51	(13.2)	96	(24.7)	190	(49.0)	42	(10.8)	9	(2.3)

Questions	Frequency (%)				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
intervention.					

4.1.4. Barriers to treatment and care of Children's malocclusion by their parents

In this section, barriers can be divided into six parts: affordability, accessibility to dental clinics and orthodontic specialist clinics, length of the orthodontic treatment, uncomfortable appearance of the children due to the metal orthodontic brackets, pain during the treatment and required oral health maintenance.

The majority of the respondents have all six barriers to treatment and care of children's malocclusion, that is, orthodontic treatment. Firstly, 67.3% of the participating parents could not afford the treatment cost of the malocclusion while the rest (32.7%) did not have this barrier. Then, almost all the participants (93.3%) of the population did not have access to dental clinics and suitable orthodontists for the treatment and care of malocclusion while only 6.7% can have access to the dental clinics and orthodontic specialist clinics. This barrier can be marked as the most common barrier to the treatment of malocclusion for this study.

81.4% of the respondents cannot wait for the length of the orthodontic treatment, and only 18.6% of them can tolerate the length of the treatment period. Nearly three quarters (72.9%) of the participants are not willing to start orthodontic treatment due to the uncomfortable appearances of the children due to the metal brackets on the teeth. The second most common barrier is the pain arising during the

treatment of malocclusion and 87.4% of the respondents identified themselves as having this barrier while only 12.6% of the respondents did not have this barrier. Finally, 77.6% of the parents could not manage the required oral health maintenance during the treatment period while 22.4% could manage the oral hygiene measures during the treatment and care of malocclusion.

Table 15 Barriers to treatment and care of Children's malocclusion by their parents

Questions		Frequency (%)			
		Yes		No	
i.	Affordability	261	(67.3)	127	(32.7)
ii.	Accessibility to dental clinics and orthodontic specialist clinic	362	(93.3)	26	(6.7)
iii.	Length of treatment	316	(81.4)	72	(18.6)
iv.	Uncomfortable appearance of the children due to orthodontic brackets	283	(72.9)	105	(27.1)
v.	Pain during the treatment	339	(87.4)	49	(12.6)
vi.	Required oral health maintenance	301	(77.6)	87	(22.4)

In table 16, summarization of the number of barriers to treatment of malocclusion by the parents are showed. There is only one parents who did not identify any barriers. There are 28 parents that they reported to have 1 barrier. 15 parents identified that they had 2 barriers. 29 participants have 3 barriers and 35 parents had 4 barriers to treatment and care of malocclusion. 103 participants had 5 barriers and 177 respondents have all six barriers to malocclusion treatment.

Table 16 Summarized on number of barriers to treatment and care on Children's malocclusion of parents (n = 388)

Number of barriers	Number of responses
No barriers	1
1 barrier	28
2 barriers	15
3 barriers	29
4 barriers	35
5 barriers	103
6 barriers	177

4.1.5. Parental Practice on children's malocclusion

The section of parental practice is composed of three parts: routine observation of malocclusion, treatment, and prevention of malocclusion as shown in the Table 17.

The first part showed that 72.4% of the parents regularly notice the dental alignment of their children in which over one-fourth (27.6%) of the parents did not notice if there is misalignment of the teeth or not. Regarding jaw problems, 61.9% of the participants knew if there is a jaw problem in their children while 38.1% of the participants did not notice the jaw problems in their children's facial structure. Similarly, to the sub-part of children's dental alignment, the almost same distribution of 72.9% showed that parents regularly observed for the oral bad habits in the children while 27.1% did not observe oral bad habits in a regular manner in their children.

Secondly, the exact same distribution of 50% described in the part of regular visit to dental clinics at least once a year. Almost 80% of the respondent parents showed that they allowed to do orthodontic treatment for their children if they are willing to do based on the professional advices and only 20.6% of the participants answered that they wanted to start orthodontic treatment in their children despite the children were against to receive it. Lastly for this part, 72.2% of the respondents were willing to start the children's malocclusion treatment if their children have not passed their puberty yet while 27.8% of the participants answered that they preferred to start the orthodontic treatment beyond their children's puberty.

The final part for this section is the preventive practice of children's malocclusion by their parents. The majority (more than 77%) of the parents practiced all five preventive techniques of children's malocclusion. 83.2% of the parents practiced their children to change dietary habits, for example, reduced intake of sugar, to prevent malocclusion in children and, on the other hand, only 16.8% did not practice to change diet habits. An exactly equal distribution of 83.2% can be found in another preventive technique, that is, prevention of early loss of the teeth. These two techniques mark the second most preventive practice adopted by the parents. Among all the preventive measures, avoiding oral habits is the most common technique and 87.9% (nearly 90%) of the participating parents adopted this practice to prevent malocclusion in their children. Last but not least, 80.7% and 77.8% of the respondents practiced the use of removable orthodontic appliances and serial extractions respectively to prevent the incidence of malocclusion in children.

Table 17 Parents' Practice on children's malocclusion

Questions	Frequency (%)			
	Practice		Not Practice	
1) Parental practice of routine observation of malocclusion in children. i) I regularly notice the alignment of my child's teeth.	281	(72.4)	107	(27.6)
ii) I know if my child has jaw problem	240	(61.9)	148	(38.1)
iii) I regularly observe some oral bad habits in my children, for example, thumb sucking, tongue thrusting, mouth breathing	283	(72.9)	105	(27.1)
2) Parental practice of treatment of malocclusion in children. i) I always take my children to visit the dentist at least once a year.	194	(50.0)	194	(50.0)
ii) Based on the professional treatment need advice, if my children need orthodontic treatment, I allow to do orthodontic treatment for my children only if he or she is willing to do.	308	(79.4)	80	(20.6)
iii) I will start orthodontic treatment of my child if my children have not passed puberty yet.	280	(72.2)	108	(27.8)
3) Parental practice on prevention of	323	(83.2)	65	(16.8)

Questions	Frequency (%)			
	Practice		Not Practice	
malocclusion in children				
i) Changing diet habits (for example, less sugar intake)				
ii) Prevention of early loss of teeth	323	(83.2)	65	(16.8)
iii) Avoiding oral bad habits	341	(87.9)	47	(12.1)
iv) Use of removeable orthodontic appliances	313	(80.7)	75	(19.3)
v) Timely treatment of malocclusion like serial extraction	302	(77.8)	86	(22.2)

In table 18, we summarized the overall average scores of knowledge, attitude, and practice scores of parents regarding the children's malocclusion. There are 14 questions in regards to the parental knowledge of malocclusion and the total score for this section is 14. Among all the participants, the mean score for this section is 9.3 ± 4.186 ranging from 1 - 14. Another section is parental attitude towards children's malocclusion with 5 questions. The total score for this section is 25. The average score for this section is 18.7 ± 3.538 with the least score of 7 and the best score of 25. The parental practice is divided into 3 parts: routine observation, treatment and prevention of malocclusion in children with the total score of 3, 3, and 5 respectively. Firstly, concerning routine observation, the average score for this part is 2.07 ± 1.239. Then, according to treatment of malocclusion, the average score for this part is 1.43 ± 0.870. Lastly, regarding the prevention of malocclusion, the mean score for this part is 4.13 ± 1.476.

Table 18 Summarized of knowledge, attitude, and practices scores of parents regarding children's malocclusion (n=388)

Variable	Number of questions	Total score	Score of respondents	
			Mean ± SD	Range
Knowledge of malocclusion	14	14	9.3 ± 4.186	0 - 14
Attitude on malocclusion	5	25	18.7 ± 3.538	7 - 25
Practices regarding malocclusion	11	11	7.6 ± 2.737	0 - 11
P1: Parental practice of routine observation of malocclusion in children	3	3	2.07 ± 1.239	0 - 3
P2: Parental practice of treatment of malocclusion in children	3	3	1.43 ± 0.870	0 - 3
P3: Parental practice on prevention of malocclusion in children	5	5	4.13 ± 1.476	0 - 5

4.2. Inferential Findings

4.2.1. Comparison of Parental Practice regarding Children's malocclusion among different individual factors

The total scores of the parental practice ranges from 0 to 11. The mean score of the parental practice is 7.63 (standard deviation = 2.74). In table 19, the mean score between different sexes are significantly different [F = 4.39, p-value = 0.047]. In this study, it showed that fathers have more practice scores than mothers. The mean practice score had a significant difference between biological and non-biological parents on the total practice scores [F = 20.97, p-value <0.001]. Biological parents had a better practice score than non-biological parents. The parents of aged between 41 to 50 years had the best practice score, followed by the parents of 31-40 years age group and then 21 to 30 years age group [F = 8.70, p-value <0.001].

The average practice score among parents with different levels of education are significantly different [F =90.43, p-value <0.001]. This study shows that parents with graduate level and post-graduate level had more practice scores than those lower than graduate level. The mean practice score in parents who are employed are significantly higher than those who are unemployed [F = 46.25 p-value <0.001]. When it comes to the different categories of occupation, parents who are working in non-government organizations have the greatest practice scores followed by parents who are a full-time student, business owner, company employee, freelancer, and lastly the government officers. [F = 12.34, p-value <0.001]. According to monthly household income, parents who earned more than 2,000,000 MMK per month had the

greatest score while parents who earned less than or equal to 2,000,000 MMK had the lower practice score [F =4.82, p-value = 0.029].

In Table 19, parents who had received orthodontic treatment once in their lives have significant different practice score than those who had not received any kinds of treatment and care of malocclusion. [F = 100.83, p-value <0.001]. Parents who had received orthodontic treatment once in their lifetime had more practice score than parents who did not received orthodontic care.

Table 19 Individual Characteristics and different mean scores of Practices by Parents regarding Children's malocclusion

Demographic Characteristics		Parents n	Practice Mean ± SD	p-value
Sex				0.047*
	Male (Father)	172	8.0±2.58	
	Female (Mother)	216	7.4±2.84	
Biological Parents				<0.001*
	Yes	369	7.8±2.59	
	No	19	4.9±3.92	
Age group				<0.001*
	20 - 30 years	89	6.6±3.09	
	31 - 40 years	208	7.9±2.61	
	41 - 50 years	91	8.1±2.40	
Education Level				<0.001*
	< graduate level	111	5.8±3.22	
	≥ graduate level	277	8.4±2.09	

Demographic Characteristics		Parents n	Practice Mean ± SD	p-value
Status of Employment				<0.001*
	Unemployed	86	6.0±2.97	
	Employed	302	8.1±2.47	
Occupation				<0.001*
	Unemployed	86	6.0±2.97	
	Student	3	9.7±0.58	
	Government Officer	57	6.8±2.91	
	Business Owner	114	8.8±2.16	
	Company Employee	110	8.0±2.36	
	Freelancer	12	7.9±2.31	
	Non-government officers	6	9.7±1.03	
Monthly Household Income				<0.029*
	≤ 2,000,000 MMK	344	7.5±2.79	
	> 2,000,000 MMK	44	8.5±2.10	
History of previous orthodontic treatment				<0.001*
	No	301	7.0±2.74	
	Yes	87	9.9±0.71	
History of malocclusion				0.313
	No	188	7.5±2.40	
	Yes	200	7.8±3.02	
*p-value < 0.05				

4.2.2. Simple Linear Regression analysis to show the association between Parental Knowledge, Attitude, Barriers to treatment and care of malocclusion and parental practice regarding Children's malocclusion

The independent variables are the parental knowledge and attitude regarding children's malocclusion and the barriers to treatment and care of children's malocclusion. The dependent variable is the parental practice regarding children's malocclusion. This study showed that the parental knowledge, attitude and five barriers except accessibility to dental clinics and orthodontic specialists' clinic are the significant predictors of parental practice regarding malocclusion in children (p-value <0.001). In table 18, the results indicated that parental knowledge (β = 0.796), the parental attitude (β = 0.682), barriers to treatment and care of malocclusion such as affordability (β = -0.378), length of treatment (β = -1.198), uncomfortable appearance of the orthodontic metal brackets on their children's teeth (β = -0.168), pain during the treatment of malocclusion (β = -0.134) and required oral health maintenance (β = -0.182) are the most significant factors with parental practice regarding children's malocclusion. The results of simple linear regression table is shown in table 20.

Table 20 Simple linear regression analysis of parents' practice regarding children's malocclusion

Variables	B	SE	*β*	95% CI	p-value
Knowledge	0.520	0.020	0.796	0.481-0.560	<0.001*
Attitude	0.528	0.029	0.682	0.471-0.584	<0.001*
Barriers					
Affordability	-2.202	0.274	-0.378	-0.2742 – (-1.663)	<0.001*
Accessibility to dental clinics and orthodontic	-0.109	0.556	-0.010	-1.203 – 0.985	0.844

specialist clinic					
Length of treatment	-1.189	0.353	-0.169	-1.882 – (-0.496)	<0.001*
Uncomfortable appearance of the children due to orthodontic brackets	-1.031	0.309	-0.168	-1.638 – (-1.638)	<0.001*
Pain during the treatment	-1.102	0.415	-0.134	-1.918 – (-0.286)	0.008*
Required oral health maintenance	-1.190	0.328	-0.182	-1.835 – (-0.545)	<0.001*

*p-value <0.05; B = Unstandardized B; SE = Coefficients Standard Error; β=Standardized Coefficients Beta

4.2.3. Multiple Linear Regression

Multiple linear regression was conducted to detect the association factors (independent variables) which are related to parental practice of children's malocclusion (dependent variable). We analyzed three models in this part with enter method. In the first model, the following independent variables were included: age, gender, status of biological parents, education level, status of employment, monthly household income, parental knowledge, parental attitude regarding children's malocclusion and barriers to treatment and care of malocclusion. The predicted variables: status of employment, parental knowledge, parental attitude and the barrier of uncomfortable appearance due to the orthodontic metal brackets were significant in the Model 1. These variables were analyzed in the model 2. In this second model, parental knowledge, parental attitude and the barrier (uncomfortable appearance due to the orthodontic metal brackets) were significant and were further analyzed in the model 3. All three variables were remained significant with p-value less than 0.001.

The table 21 describes the comparison of the three models. All three models show significant F change with p-value <0.001. For the model 1, 68% of the variance in parental practice of children's malocclusion can be explained by predictor [F (13,374) =61.066, p-value<0.05, R2 = 0.68 and adjusted R2 = 0.68]. Regarding the model 2, it can explain 67.1% of the variance on parental practice of malocclusion in children. [F (4,383) =195.5, p-value<0.05, R^2 = 0.671 and adjusted R^2 = 0.668]. In model 3, it can explain the 66.8% of variance on parental practice regarding children's malocclusion. [F (3,384) = 257.9, p-value<0.05, R^2 = 0.668 and adjusted R^2 = 0.666]. Therefore, model 1 showed the highest R^2 value than model 2 and model 3. It showed the higher value of R with 0.82 and R2 with 0.68 than Model 2 and Model 3. The R2 has also changed by 0.68 and it is significant. However, the model 3 has only 3 variables which predicts the outcome variable. Therefore, model 3 is considered as the most suitable model for predicting the parental practice of malocclusion in children with the equations as followed.

Model for Parental Practice of Children's Malocclusion = β0 + β1 (Parental Knowledge) + β2 (Parental Attitude) + β3 (Barrier of Uncomfortable appearance of orthodontic brackets)

Parental Practice of Children's Malocclusion = 0.693 + 0.647 (Parental Knowledge) + 0.187 (Parental Attitude) – 0.156 (Barrier of Uncomfortable appearance of orthodontic brackets)

$\beta_{\text{Parental knowledge}}$ =0.647. As the knowledge score will increase in 1 point, the parental practice score will rise by 0.647 when controlling for parental attitude and barrier for uncomfortable appearance. (p-value < 0.05)

$\beta_{\text{Parental Attitude}}$ = 0.187. As the attitude score will increase in 1 point, the average our paretnal practice score will increase by 0.187. (p-value < 0.05)

$\beta_{\text{Uncomfortable appearance of orthodontic brackets}}$ = When the parents answered that there is a barrier of uncomfortable appearance of orthodontic brackets, we estimated our parental practice score to be lower by -0.156 scores. (p-value < 0.05).

Table 21 Multiple Linear Regression Analysis for variables predicting Parental Practice regarding Children's malocclusion

	Model 1			Model 2			Model 3		
	B	**β**	**Sig.**	**B**	**β**	**Sig.**	**B**	**β**	**Sig.**
Constant	1.125		0.152	1.557		0.002*	0.693		<0.001*
Age	0.003	0.007	0.831						
Gender	-0.314	-0.057	0.087						
Biological Parents	0.331	0.026	0.399						
Education Level	0.256	0.042	0.258						
Status of Employment	0.492	0.075	0.037*	0.382	0.058	0.063			
Monthly Household Income	0.358	0.041	0.173						
Knowledge	0.414	0.634	<0.001*	0.415	0.635	<0.001*	0.423	0.647	<0.001*
Attitude	0.127	0.164	0.001*	0.138	0.179	<0.001*	0.144	0.187	<0.001*
i. Affordability	0.189	0.032	0.354						
iii. Length of treatment	-0.304	-0.043	0.250						
iv. Uncomfortable appearance of the children	-0.783	-0.127	0.001*	0.182	-0.150	<0.001*	-0.960	-0.156	<0.001*

	Model 1			Model 2			Model 3		
	B	**β**	**Sig.**	**B**	**β**	**Sig.**	**B**	**β**	**Sig.**
due to orthodontic brackets									
v. Pain during the treatment	0.131	0.016	0.695						
vi. Required oral health maintenance	0.044	-0.007	0.870	1.557					
p-value <0.05; B = Unstandardized B; SE = Coefficients Standard Error; β=Standardized Coefficients Beta									

Table 22 Model Summary of Multiple Linear Regression

Model	**R**	**R Square**	**Adjusted R Square**	**R Square Change**	**F Change**	**df 1**	**df 2**	**Sig. F Change**
Model 1	0.824	0.680	0.669	0.680	61.066	13	374	<0.001*
Model 2	0.819	0.671	0.668	0.671	195.522	4	383	<0.001*
Model 3	0.817	0.668	0.666	0.668	257.881	3	384	<0.001*

Chapter 5

Discussion

In this chapter, discussion, conclusion, limitation, and recommendation are described based on the results of this study. In this cross-sectional study, there are 388 parents who are currently residing in 10 districts of Yangon, Myanmar. The objective of this study is to study the knowledge, attitude, barriers and practice of parents on malocclusion in children living in Yangon, Myanmar. The findings of this study are discussed by contrasting with findings from other similar researches from other countries. Due to the limited number of literatures from the neighboring countries, there are some limitations to compare studies performed with different methodologies in different countries.

5.1. Socio-demographic Characteristics and Knowledge, Attitude, Treatment Barriers and Practice of Parents regarding Children's malocclusion

5.1.1. Socio-demographic Characteristics of Parents

The total participants of the study is 388 and this study has more participants than other similar studies from Saudi Arabia and India (25, 30). Most of the participants are females (55.7%) which is similar in most of the studies globally (23, 25, 30, 41) because most of the mothers are more aware of the children's facial aesthetics and this can influence the uptake of the treatment and care of malocclusion in their children (42). Therefore, mothers are more interested to participate in this research.

Most of the parents are graduate level (67.3%) showing that there are similar studies with more participants are graduate level or more which is equivalent to supra-diploma or bachelor degree level (23, 39, 41). In the case of previous history of previous orthodontic treatment, the majority of the parents have not ever received ant kinds of orthodontic treatment once in their life time similarly in the study of Saudi Arabia (25). Further remaining individual characteristics in our studies are not included in other similar studies of other countries.

5.1.2. Parental Knowledge regarding Children's Malocclusion

A striking revelation from this study is that 55.4% of parents did not correctly identify malocclusion as an inherited condition. The study in rural populations of India also showed the similar findings that Indian population has no concern with the genetic etiology of the malocclusion (30). This indicates a need for increased education and awareness efforts, as understanding the hereditary nature of malocclusion is fundamental to its prevention and management.

While the majority of parents correctly associated malocclusion with esthetic problems, only 26% of the respondents did not did not know about this. The relationship between malocclusion and esthetic issues is well-established and has significant implications for a child's self-esteem and overall well-being (42, 43). Yet, in other fields of knowledge regarding the causes of malocclusion such as oral bad habits, diet and early tooth loss, most of the participants know that these factors are the causes of malocclusion unlike in the literature of Soni et. al. (30). It is encouraging that over half recognized the link between malocclusion and social problems. School bullying which is one of the most prevalent social problem has the significant relationship with the malocclusion and this negatively effects the oral

health related quality of life (OHRQOL) (6). According to the findings from this research, more than half of the respondents (52.1%) do not know about the traumatic risk of malocclusion, for example, sticky-out tooth. This finding is different from another study from Saudi Arabia that the Saudi Arabian parents have high knowledge concerning the risk of the accidental trauma due to the malocclusion (25).

This study describes that many parents held accurate knowledge about preventive measures for malocclusion, such as dietary habits and oral bad habits. Encouragingly, the majority recognized the role of reducing sugar intake, serial extraction and avoiding oral bad habits in preventing malocclusion. Nevertheless, there is still a portion of parents who may benefit from further education in this area. Avoiding oral bad habits, however, can prevent the incidence of malocclusion as these habits can cause certain types of malocclusion such as increased overjet, reduced overjet, anterior or posterior crossbite, and anterior open bite (44). 69% of parents would initiate orthodontic treatment before the puberty. Early intervention is crucial during the mixed dentition for effective treatment of malocclusion (45). Therefore, the majority of parents demonstrated good knowledge regarding the early orthodontic intervention of malocclusion.

To summarize, the findings from this part emphasize the need for targeted educational programs to address gaps in parental knowledge, particularly regarding the hereditary nature of malocclusion and its associated esthetic, social, and functional consequences. Such interventions can help ensure that parents are better equipped to make informed decisions about their children's oral health.

5.1.3. Parental Attitude towards Children's malocclusion

A significant proportion of parents displayed positive attitudes when it came to recognizing the importance of addressing oral habits and dentofacial abnormalities in their children. Approximately 73.7% of respondents either strongly agreed or agreed to take their children to the dentist for evaluation when noticing habits like thumb-sucking. This demonstrates that a proactive approach among parents in identifying potential issues early, which is crucial for effective intervention and this can be considered to be the positive attitude. Similar findings can be found that nearly 75% of respondents showed positive attitudes when it came to taking their children to dental clinics to prevent oral bad habits and dentofacial problems. This willingness to engage in preventive measures is encouraging, as it can significantly reduce the likelihood of malocclusion development. The more the earlier is the orthodontic intervention takes place the more incidence of malocclusion in the children to prevent or reduce the incidence of malocclusion later in the permanent dentition period. Therefore, early intervention serves the identical purpose as interceptive orthodontics by minimizing factors that could impede the regular development of the dental arches (46).

Parents' attitudes toward regular dental check-ups for their children were predominantly positive in this study, with 82.2% either positively agreeing or agreeing that children should be taken to dental clinics annually for check-ups. Different from the study in India, only 11.8% of the parents took their children to regular dental check-ups (41). Routine dental visits are important for the maintenance of good oral health which is an integral component of systemic health (47, 48)

Regular check-ups are essential for early detection of malocclusion and other oral health issues, and the majority of parents demonstrated an understanding of this.

In this study, a substantial 69.8% of parents identified a positive attitude by not waiting for the eruption of wisdom teeth if orthodontic treatment was necessary. This aligns with best practices in orthodontic care, where early intervention can often lead to more effective treatment outcomes. When it came to surgical intervention, the attitudes were more evenly distributed. Approximately half of the participants expressed a neutral stance, while 37.9% showed a positive attitude towards waiting for children to get older before considering surgical intervention. Only a small proportion, 13.1%, either disagreed or strongly disagreed with this approach. This variation in parental attitudes may be due to the complexity and invasiveness of surgical procedures, as well as individual considerations related to a child's age and health.

5.1.4. Barriers to Treatment and Care of Malocclusion in Children by their Parents

This study indicates that all of the participants have faced the barriers to treatment and care of malocclusion. A significant proportion of parents (67.3%) identified affordability as a barrier to treatment of malocclusion in children. This underscores the importance of addressing cost-related concerns to ensure access to care. Different studies in Saudi Arabia showed that the cost of the orthodontic treatment is the most concerned barrier while it is the least concerned barrier among all six barriers to treatment and care of malocclusion in this study (39). In the study from Iran, treatment cost of malocclusion was identified as the most common barrier to treatment and care of malocclusion (49).

A striking 93.3% of parents reported difficulty accessing dental clinics and suitable orthodontists. Therefore, the accessibility is the first prioritized barrier among all six barriers mentioned in this study. Our study also aligns with the study from Aseer that accessibility is the one of the most common barriers to treatment of malocclusion (50). The study in Saudi Arabia mentioned the geographic accessibility specifically that this type of accessibility is the top prioritized barrier when it comes to treatment of malocclusion (31). This represents a significant barrier that needs to be addressed to improve access to treatment.

The third most prioritized treatment barrier in this study is length of the treatment. The majority (81.4%) expressed concerns about the duration of orthodontic treatment which is very time consuming. Addressing these concerns through patient education and communication is crucial. Similar study in Saudi Arabia has shown that 71% of the total respondents identified treatment duration as one of the second common barrier to the treatment and care of malocclusion (31). Comprehensive orthodontic treatment takes much time ranging from one to two years while growth modification treatment needs take more time to complete the treatment (51). Yet this treatment is influenced by a number of factors such as the type and class of the malocclusion, the presence or absence of the additional treatments like extraction of premolars, etc. (52). Therefore, the parents may feel the uncertainty that the treatment takes too long.

Nearly three-quarters of parents (72.9%) expressed discomfort with the appearance of orthodontic metal brackets on their children's teeth, which can deter them from seeking treatment. Similarly, in the study of India, 18% of the male

adolescents stated that it was embarrassing to wear metallic brackets on their teeth as they are not aesthetically pleasing (53). Another previous study mentioned that only adults have esthetic concerns for the orthodontic brackets and younger aged patients did not complaint about their appearances (54). This research has only accessed and asked the questionnaires to the parents, so, they might have been more sensitive with the uncomfortable appearances due to the orthodontic appliances when compared with younger orthodontic patients. Moreover, this underscores the importance of aesthetic considerations during the orthodontic care.

In this study, a high proportion (87.4%) of the participants identified pain during treatment as a barrier. This is the second most common barrier in this study which is similar in the study of Saudi Arabia in which pain during the orthodontic treatment ranked as second barrier to treatment and care of malocclusion (39). However, different results can be found in the study from India that only 9% of the respondents identified pain as the barrier to orthodontic treatment (53). Thus, pain management should be a concern and highly prioritized in orthodontic treatment and care.

The majority of parents (77.6%) reported difficulty managing required oral health maintenance during treatment. In a qualitative study from Pakistan, children are not motivated to do the oral health maintenance during the treatment and care of malocclusion. So, on the other hand, parents were being instructed how to adopt oral hygiene measures in their children during the orthodontic treatment (54). However, parents should be involved and assist their children during the tooth brushing time in order to achieve the good oral hygiene and prevent from periodontal diseases. These

findings emphasize the need to address these barriers of orthodontic treatment to ensure that parents have access to affordable, accessible, and comfortable orthodontic care for their children.

5.1.5. Parental Practice regarding Children's malocclusion

A major portion (72.4%) of the parents in this study regularly observed the dental alignment of their children, which indicates a good practice for early detection. However, there is room for improvement as 27.6% did not notice misalignment. Similar study in India has shown that nearly the same proportion as this study (64%) of the participants regularly observed the children's irregular arrangement of the teeth (41). Malocclusion frequently originates from poor oral practices and the widespread belief that milk teeth would naturally exfoliate, reducing the need for professional dental care. A large number of cases remain untreated because parents are still unaware about malocclusion and fail to take appropriate steps (55).

In this current study, only half of parents reported regular annual visits to dental clinics for their children, aligning with preventive care practices. Regular dentist visits provide the chance for early oral condition diagnosis such as malocclusion, prompt treatment and care t dental problem, and preventative dental services as necessary (56, 57). Regular dental visits have been associated to improved oral health-related quality of life and better oral health self-perception (58, 59). In the United Kingdom, patients under the age of eighteen should have their oral health examinations every 12 months (once a year), according to guidelines provided by the National Institute of Health and Care Excellence (NICE) (60).

A substantial portion (80%) allowed orthodontic treatment if it was professionally recommended, demonstrating a willingness to follow expert advice. Since children and adolescents must rely on their parents and guardians financially and decisively, the final decision-making depends with their respective parents and caregivers (25). This aligns with the previous study that patients are more preferred to follow the orthodontists' advices when compared with the general practitioners for functional aspects when there is the severe malocclusion (61).

When it comes to the treatment timing of the malocclusion in children, the study showed that a high proportion of 72.2% will start their children's orthodontic treatment as soon as possible, that is, before the puberty growth spurt. There are a number of studies showing that the orthodontic treatment, mainly the removable appliances, are the best effective during the growth of the mandible, that is, not beyond the pubertal growth spurt (62-65). Since girls generally reach puberty two years earlier than boys, if malocclusion problems in girls are not treated when they are necessary, there is an increased risk that the severity of the skeletal difference will get worsen and require more expensive and intrusive treatment methods in the future (63).

Parents displayed positive preventive practices, with high proportions adopting strategies like dietary habit changes (83.2%), prevention of early tooth loss (83.2%), avoiding oral habits (87.9%), use of removable appliances (80.7%) and serial extraction (77.8%). This is surprising that the findings from this study is completely opposite with the study in India except avoiding oral bad habits (30).

Preventive measures towards malocclusion can lower the duration and the amount of money needed for the orthodontic treatment.

In summary, the findings indicate that most of the participating parents engage in positive practices, including routine observation, preventive measures, and adherence to professional advices. However, there is still room for improvement, particularly in routine observation and awareness of oral health practices.

5.2. Association between Parents' Characteristics and Parental Practice in Children's Malocclusion

Parental practice regarding children's malocclusion is influenced by various individual factors, as observed in this study. The study's findings indicated that a significant gender difference in parental practice, with fathers exhibiting higher practice scores than mothers. This result is consistent with prior research (25). This finding is different in other studies from Saudi Arabia that mothers are more sensitive in taking care of their children's malocclusion and, moreover, mothers had more concern in children's aesthetic appearances (25). It could be assumed that fathers tend to be more proactive in seeking dental care for their children, while mothers are often responsible for day-to-day household activities. Potential risk of for the children's need of malocclusion treatment which is based on aesthetic, functional and psychosocial aspects might not be into consideration by the mothers. However, this has not been in research studies yet. This gender-based variation underscores the importance of involving both parents in deciding the treatment needs of not only malocclusion but also the overall oral health of their children.

Another finding is the marked difference in practice scores between biological and non-biological parents, with biological parents demonstrating higher practice scores. However, there is a limited amount of studies in which the status of being a biological parent have associated with the practice in children's malocclusion. Our research suggests that biological parents tend to have a more substantial role in taking care of their own children and making oral health decisions for their children whenever necessary.

Moreover, the study indicated that parents aged 41 to 50 years exhibited the best practice scores. It can be assumed that parents at this group have more stabilized economic status and level of employment and then can spend much money on their children's aesthetic concerns whenever necessary. Moreover, we observed that older parents often prioritize to provide preventive dental care for their children.

This study identified significant variations in practice scores based on parents' education levels and occupations. Additionally, parents who are employed demonstrated higher practice scores than those who are unemployed. We found that parents with higher education levels tend to engage in better oral health practices for their children. A study form Mumbai, India indicated that similar age group of >45 years of mothers had higher practice scores in children's malocclusion. In the same study, it also identified that parents with graduate and post-graduate level had marked increase in practice score than other levels of education (66). This also aligns with our study that parents at graduate and post-graduate level have a significantly higher practice scores than other groups of educational level. These findings emphasize the

importance of tailoring educational interventions to address the specific needs of parents in every level of education and employment statuses.

Monthly household income was also a significant factor affecting parental practice, as reported in this study. Similarly, mothers with higher socio-economic status have higher practice scores towards oral health (66). In this study we assumed that parents with higher incomes (>2,000,000 MMK) are more likely to afford the cost of the malocclusion treatment such as orthodontic treatment for their children. Ensuring accessibility to oral health care for parents with lower incomes is an essential consideration.

A strong association was found between the parents who had received orthodontic treatment once in their lives and higher practice scores. Different from the study in Saudi Arabia, there is no significant difference in mean practice scores between the parents with history of orthodontic treatment and those without history of orthodontic treatment (25) We suggested that parents who have undergone orthodontic treatment themselves tend to be more proactive in seeking orthodontic care for their children.

Multiple linear regression analysis was employed to explore the factors associated with parental practices in managing children's malocclusion (dependent variable). The analysis involved three models using the enter method, with various independent variables. Model 1 incorporated the following independent variables such as age, gender, biological parent status, education level, employment status, monthly household income, parental knowledge, parental attitude toward children's malocclusion, and barriers to treatment and care of malocclusion. Among these

variables, the predictors that exhibited statistical significance were parental knowledge, parental attitude, and the barrier related to the uncomfortable appearance due to orthodontic metal brackets. The variables that remained statistically significant within Model 3 included parental knowledge, parental attitude, and the barrier associated with the uncomfortable appearance of orthodontic metal brackets. Similar study showed that moderate to high parental knowledge and attitudes towards their children's malocclusion problems and practice of children's malocclusion such as treatment needs (25). Moreover, another study had shown that poor knowledge and attitude of the mothers regarding children's oral health can predict the parental practice. Therefore, oral health behavior of both the parents can affect oral health behavior of their own children (66). This indicates that these factors play a substantial role in predicting parental practices concerning children's malocclusion.

The inferential findings of this research show several significant associations between parental practice and various individual factors. In conclusion, the results indicate that factors such as parental knowledge, attitude, and barriers significantly influence parental practice regarding children's malocclusion.

5.3. Limitations

There were some limitations in this study. Firstly, this study only targeted the urban population in Yangon, so, it did not represent the whole parental community in Myanmar. Second, due to the political situation, internet access is not available everywhere. However, there are some conditions of poor Wi-Fi connection and there can be some difficulties to assess to the Google Form. Lastly, this study does not include malocclusion assessment in children. Without the assessment of malocclusion, the real situation of malocclusion cannot be identified and through the

Google Form survey, only knowledge, attitude, barriers and practice can be assessed which it means, the researcher cannot detect the real performance of parents.

5.4. Recommendations

5.4.1. Recommendations according to the research findings for further study

We recommend to do more research regarding the malocclusion assessment in both adult and children and assessment of knowledge, attitude and practice regarding malocclusion. Research regarding malocclusion is uncommon in both global and national level when compared with other dental public health problems like dental caries, periodontal diseases oral cancer, etc. However, more studies of malocclusion are in need as literatures concerning situation, and prevalence of malocclusion are still limited as the country level. Regarding the knowledge of the parents, we recommend the general practitioner dentists and dental public health professionals to advocate more about the genetic factors of the malocclusion to raise awareness.

5.4.2. Recommendations on Parental Practice regarding Children's Malocclusion

The overall practice taking part to prevent malocclusion is good enough among the participants in this study. However, most of the parents do not aware of the hereditary na Concerning the parental practice of malocclusion, the practice regarding the regular visit to dental clinics is the least practice (50%), therefore, this practice must be done more in order to get prompt referral and preventive measures in the case of not only malocclusion but also other dental public health problems. Regular visits to dental clinic can reduce the incidence of oral pathologies such as dental caries, periodontal diseases not only in children but also the general population (67).

5.4.3. Recommendations on Policy Making of Dental Health

In this study, we recommend the prompt referral of malocclusion. Adequate referral of the dental public health problems like malocclusion is crucial in prevention and they can be three activities from this program: Capacity Building of Community Dental Health Monitor Volunteers (DHMV), Routine Free Dental Health Check-up and Deployment of the Mobile Dental Van for the primary health care mobile teams. These activities can ensure the accessibility to the dental care of the children initiating the dental referral if necessary.

According to the 2021 study in Myanmar, the ratio of dentist to population is roughly 1:16,000. There are approximately 5,000 registered dentists, and 400 dental nurses and among them, only 1,000 dentists were working under public sectors. Due to the limited dental health workforce and inequality of dentists between the public and private sectors in Myanmar, the inequalities in dental health care are compounded (68). So, we need volunteers and health staffs to monitor the dental health in the community where there are no dentists especially in the remote areas by training them with modified curriculum of oral health screening from dentists. In this way, dental workforce can be sufficiently achieved. The last program is to amend the National School Health Policy (2014) by adopting the routine oral health monitoring scheme for children under 10 years of age. In this way, we can refer the pediatric patients with not only malocclusion but also other oral health problems such as dental caries, periodontitis, traumatic dental injury, etc.

In order to ensure the community to be able to pay for the dental health expenses, ministry of health to do intersectoral collaboration with Ministry of

Planning and Finance by amending National Insurance Business Law (1998) to initiate dental health coverage, for example, emergency cases like traumatic dental and maxillofacial injuries, in the general health insurance package. In this way, we can minimize preventable dental health-related disorders among children.

5.5. Conclusion

Our study underscores the significance of parental knowledge, attitude and the barrier of uncomfortable appearance of orthodontic metal brackets in driving parents' practices concerning children's malocclusion in Yangon, Myanmar. To enhance children's oral health, targeted educational efforts and awareness campaigns for parents are essential. Empowering parents with knowledge and fostering positive attitudes can encourage them to take proactive steps in preventing and treating malocclusion in their children. Strengthening these initiatives is vital to improving oral health outcomes among the younger population in the region.

Appendix

Appendix 1

I. Screening questions for participants

i) Are you between 20 – 50 years of age?

Yes

No

ii) Is your child's age between 6-12 years old?

Yes

No

iii) Are you currently residing in Yangon at least 6 months or more?

Yes

No

iv) Are you currently living with your children together for at least 1 year?

Yes

No

v) Is your professional background related to dentistry? (for example, dentist, dental nurse, dental technician)

Yes

No

II. Sociodemographic Characteristics

Parents' Characteristics

1) Age: _____ years old
2) Sex
   - ❒ 1. Male (Please specify 1.1. I am a biological Father, 1.2. I am not a biological father)
   - ❒ 2. Female (Please specify 2.1. I am a biological mother, 2.2. I am not a biological mother)
3) Occupation
   - ❒ 1. Unemployed

- ❒ 2. Student
- ❒ 3. Government Officer
- ❒ 4. Business Owner
- ❒ 5. Company Employee
- ❒ 6. Freelancer (Please specify: ____)
- ❒ 7. Others (Please Specify: _____)

4) Education Level (25)

- ❒ 1. Middle school or less
- ❒ 2. High School
- ❒ 3. Undergraduate Level
- ❒ 4. Graduate Level
- ❒ 5. Postgraduate Level

5) Monthly Individual Income

- ❒ 1. < 144,000 MMK
- ❒ 2. 144,000 – 300,000 MMK
- ❒ 3. 300,001 – 500,000 MMK
- ❒ 4. 500,001 – 1,000,000 MMK
- ❒ 5. > 1,000,000 MMK

6) Monthly Household Income

❒ 1. < 288,000 MMK

❒ 2. 288,001 – 600,000 MMK

❒ 3. 600,001 – 1,000,000 MMK

❒ 4. 1,000,000 – 2,000,000 MMK

❒ 5. More than 2,000,000 MMK

7) History of Previous Orthodontic Treatment such as Braces, Removeable appliances (25)

1 - Yes

2 - No

8) History of Malocclusion

0 – No

1 - Yes

9) Number of your offspring: _____

Characteristics of your offspring whose age is between 6-12 years

Children 1's age: _____ years

Children 1's sex: ❒ 1. male ❒ 2. female

Children 1's level of education: ❒ 1. Primary School ❒ 2. Secondary School

Children 1's history of oral habit: ❒ 1. Thumbsucking
❒ 2. Mouth Breathing
❒ 3. Tongue Thrusting
❒ 4. I Don't Know

Children 1's history of malocculsion assessed by dentist

❒ 1. Yes

❒ 0. No

❒ 2. I Don't Know

Children 1's history of previous orthodontic treatment

❒ 1. Yes

❒ 2. No

Children 2's age: _____ years

Children 2's sex: ❒ 1. male ❒ 2. female

Children 2's level of education: ❒ 1. Primary School ❒ 2. Secondary School

Children 2's history of oral habit: ❒ 1. Thumbsucking
❒ 2. Mouth Breathing
❒ 3. Tongue Thrusting
❒ 4. I Don't Know

Children 2's history of malocculsion assessed by dentist

❒ 1. Yes

❒ 0. No

❒ 2. I Don't Know

Children 2's history of previous orthodontic treatment

❒ 1. Yes

❒ 2. No

Children 3's age: _____ years

Children 3's sex: ❒ 1. male ❒ 2. female

Children 3's level of education: ❒ 1. Primary School ❒ 2. Secondary School

Children 3's history of oral habit: ❒ 1. Thumbsucking

❒ 2. Mouth Breathing

❒ 3. Tongue Thrusting

❒ 4. I Don't Know

Children 3's history of malocculsion assessed by dentist

❒ 1. Yes

❒ 0. No

❒ 2. I Don't Know

Children 3's history of previous orthodontic treatment

❒ 1. Yes

❒ 2. No

III. Knowledge of Malocclusion of the Participant

1) Knowledge about Causes of Malocclusion (30)

i) Genetic

0 - No

1 - Yes

2 - Don't Know

ii) **Oral Bad Habits** (Thumbsucking, mouthbreathing, tongue thrusting)

0 - No

1 - Yes

2 - Don't Know

iii) **Diet** (Eating too much sugaries)

0 - No

1 - Yes

2 - Don’t Know

iv) **Tooth Loss** (Due to Caries)

0 - No

1 - Yes

2 - Don’t Know

2) Knowledge of the respondents about Oral Health Problems of Malocclusion (30)

i) Esthetic Problem like sticky-out tooth

0 - No

1 - Yes

2 - Don’t Know

ii) Social Problems like school bully on facial appearance

0 - No

1 - Yes

2 - Don’t Know

iii) **Functional Problem like chewing problem** (Masticatory problem)

0 - No

1 - Yes

2 - Don’t Know

3) Knowledge of the respondents about Risk Factors of Malocclusion (30)

i) Traumatic Risk

0 - No

1 - Yes

2 - Don’t Know

ii) Gingivitis/ Periodontitis

0 - No

1 - Yes

2 - Don’t Know

iii) Early Tooth Loss due to caries

0 - No

1 - Yes

2 - Don't Know

4) Knowledge of the respondents about Prevention of Malocclusion (30)

i) Changing Diet Habits

0 - No

1 - Yes

2 - Don't Know

ii) Serial Extraction

0 - No

1 - Yes

2 - Don't Know

iii) Avoiding Oral Bad Habits like thumbsucking, mouth breathing, tongue thrusting

0 - No

1 - Yes

2 - Don't Know

iv) I will take my child to perform orthodontic treatment only if he or she would not pass puberty period.

0 - No

1 - Yes

2 - Don't Know

Attitude of Parents towards Malocclusion in Children

1) Attitude towards oral habits in Children which can consequently lead to malocclusion. (23)

i) If my children have thumb sucking habit, I will take them to the dentist to evaluate dentofacial abnormalities.

1 - Strongly agree

2 - Agree

3 - Neutral

4 - Disagree

5 - Strongly disagree

ii) **Due to the oral habits, for example, thumbsucking, tongue thursting), I take my children to the dental clinic as soon as possible to prevent dentofacial problems.**

1 - Strongly agree

2 - Agree

3 - Neutral

4 - Disagree

5 - Strongly disagree

2) Attitude towards treatments and prevention of malocclusion in children (23)

i) **It is necessary to take the child for regular dental visits once a year**. (66)

1 - Strongly agree

2 - Agree

3 - Neutral

4 - Disagree

5 - Strongly disagree

ii) **To begin orthodontic treatment for our children, we will not wait til their wisdom teeth erupt.**

1 - Strongly agree

2 - Agree

3 - Neutral

4 - Disagree

5 - Strongly disagree

iii) **If my child needs orthodontic management, I will do that even if he or she resists.**

1 - Strongly agree

2 - Agree

3 - Neutral

4 - Disagree

5 - Strongly disagree

IV. Barriers Towards Treatment of Malocclusion in Children

1. To access the treatment of malocclusion in children, what is the Top Barrier to Treatment and Care of Malocclusion in Children? (31)

i. Affordability

1. Yes

0. No

ii. Accessibility to dental clinics and orthodontic specialist clinic

1. Yes

0. No

iii. Length of treatment

1. Yes

0. No

iv. Uncomfortable appearance of the children due to orthodontic brackets

1. Yes

0. No

v. Pain during the treatment

1. Yes

0. No

vi. Required oral health maintenance

1. Yes

0. No

V. Practice of Parents regarding Malocclusion in Children

1) Parental practice of routine observation of malocclusion in children. (25)

i) I regularly notice the alignment of my child's teeth.

1 - Yes

0 - No

ii) I know if my child has jaw problem, for example, prominence of lower jaw)

1 - Yes

0 - No

iii) I regularly observe some oral bad habits in my children, for example, thumbsucking, tongue thrusting, mouthbreathing

1 - Yes

0 - No

2) Parental practice of treatment of malocclusion in children. (25)

i) **I always take my children to visit the dentist at least once a year.** (66)

1 - Yes

0 - No

ii) **Based on the professional treatment need advice, if my children need orthodontic treatment, I allow to do orthodontic treament for my children only if he or she is willing to do.**

1 - Yes

0 - No

iii) I will start orthodontic treatment of my child if my children have not passed puberty yet.

1-Yes

0 - No

3) Parental practice on prevention of malocclusion in children (30)

i) **Changing diet habits** (for example, less sugaries intake)

1 - Yes

0 - No

ii) Prevention of early loss of teeth

1-Yes

0 - No

iii) **Avoiding oral bad habits** (for example, thumbsucking, mouthbrathing, tongue thrusting)

1 - Yes

0 - No

iv) **Use of removeable orthodontic appliances** (for example, use of space maintainer to prevent the mesial drift of first molars)

1 - Yes

0 - No

v) Timely treatment of malocclsion like serial extraction

1 - Yes

0 - No

Appendix 2

Consent form (English Version)

You are being invited to take part in a research project. Before deciding to participate, it is important for you to understand why the research is being done and what it will involve. Please take time to read it, and do not hesitate to contact if anything is unclear or if you would like more information.

1. The objective(s) of this research is to study the knowledge, attitude, barriers and practice of parents on children's malocclusion who are currently residing in Yangon, Myanmar.

2. Informed consent will be obtained from the first page of the google form.

3. Details of the Participants. In this study, there are 385 participants (parents).

Inclusion Criteria

1) Parents' age must be between 20 to 50 years.
2) Parents of children 6-12 years of age.
3) The Place of residence must be in Yangon, Myanmar at least 6 months.
4) The parents are able to understand Myanmar language.
5) The Parents must be willing to participate.
6) The parents can access to Google Form Survey.

Exclusion criteria

1) Parents who are not living with children.
2) Parents who are dentists, dental nurses, and dental technicians.

You will need to answer the screening questionnaire to check if you are eligible or not. If you do not meet the criteria in the screening questionnaire, unfortunately you cannot participate in the research project.

4. Procedure upon the participants.

You are being instructed to complete the survey via Google form. There are no right or wrong answers; I want to know about your opinions, your knowledge, your attitude and the practice on children's malocclusion. All your answers will be saved in the Google form. The questionnaire includes six parts.

Part 1: Individual Characteristics of Parents consisting of 9 questions;

Part 2: Individual Characteristics of Children consisting of 6 questions;

Part 3: Knowledge of the Parents regarding Children's Malocclusion consisting of 4 parts. Part 1 is knowledge about causes of malocclusion with 4 questions. Part 2 is knowledge about oral health problems of Malocclusion consisting of 3 questions. Part 3 is Knowledge about risk factors of Malocclusion with 3 questions. Part 4 is knowledge about Prevention of Malocclusion consisting of 4 questions.

Part 4: Attitude of the Parents regarding Children's Malocclusion consisting of 2 parts. The first part is the attitude towards oral habits in Children which can consequently lead to Malocclusion with 2 questions and the second part is the attitude towards treatments and prevention of malocclusion with 3 questions.

Part 5: Barriers towards treatment of malocclusion in Children by their parents which includes 6 questions.

Part 6: Practice of Parents regarding Malocclusion in Children which includes 3 parts. Part 1 is Routine Observation of malocclusion in Children with 3 questions. Part 2 is Treatment of Malocclusion in children with 3 questions. Part 3 is prevention of malocclusion in children with 5 questions.

The questionnaire will take approximately 20 to 30 minutes.

5. There is no risk or harms if you are involved in this study. As explained above, this study is an interview using a structured questionnaire. There is no procedures or activities which might be harmful to the participants.

6. Benefits from this research.

- As a prompt benefit, the participants can share their knowledge, attitude, and practice of children's malocclusion.
- The participants can also describe the barriers experienced to access the treatment and care of children's malocclusion
- The findings of this research will provide how malocclusion becomes an important dental public health problem and can be the synergistic effect to develop effective interventions in prevention of malocclusion and raising the awareness of it.

7. To ensure the privacy is protected, Google form will not record Gmail address, and there is no need to answer names within the questionnaire. Google form will provide a unique ID number, which will be used as your

ID on all study-related documents. Therefore, no one can know your information. Any published results will be presented in a way that does not reveal your identity.

8. All the data will be destroyed three years after finishing the study. Please note that the phone number you provide will only be used for the purpose of providing you with a data allowance during your participation in the study. I promise not to use your phone number for any other purpose, and it will not be shared with anyone.

9. There are no costs associated with participating in this research project. To express my heartfelt thanks, a data allowance (3,000 MMK) will be given to your phone number if you answer your phone number at the end of the Google form since you give your precious time and share your experiences for this survey.

10. Participation in this study is voluntary and you do not have to accept this invitation to participate if you do not want to participate. Before you decide to participate in the study, I will first ask for your consent on the first page of the Google form. I will do this by giving you this document to read. Then I will ask your consent to participate in the survey and finally, you can proceed via the Google form.

Asking for your consent means you can decide not to participate in the research – you do not have to participate and there will not be any consequences if you say no. You can also say yes but later change your mind.

11. If you have any questions or have any concerns about the questionnaires, the researcher is ready to assist and reached at any time.

12. If the researcher does not perform upon participants as indicated in the participant information sheet and consent form, participants can report the incident to the Research Ethics Review Committee for Research Involving Human Research Participants, Group I, Chulalongkorn University (RECCU) Jamjuree 1 Bldg., 254 Phyathai Rd., Patumwan district, Bangkok 10330, Thailand, Tel./Fax. +66 2218-3202, +66-2218-3049 E-mail: eccu@chula.ac.th

13. I have read the details in participant information sheet and consent form and I have been informed and explained about the objectives, research procedures and risk and benefit of this research project by the researcher. I clearly understand with satisfaction and willingly agree to participate in this research project and give consent the researcher by signature and also received a copy of the participant information sheet and consent form.

❒ I voluntarily agree to participate.

❒ Disagree to participate.

Appendix 3:

ပူးပေါင်းပါဝင်ရန် မဆုံးဖြတ်ခင် ဒီသုတေသနကို ဘာကြောင့် ပြုလုပ်ရတယ်၊ ဘယ်လို အကြောင်းအရာတွေ ပါဝင်မယ် ဆိုတာကို သင် နားလည်ထားဖို့ အရေးကြီးပါတယ်။ အချိန်ယူသေချာဖတ်ရှုပြီး အကယ်၍ သင့်အနေနဲ့ မရှင်းလင်းပါက သို့မဟုတ် သတင်းအချက်အလက်များ ပိုမိုသိရှိလိုပါက မဆိုင်းမတွ ဆက်သွယ်မေးမြန်းနိုင်ပါတယ်။
ဒီ သုတေသနစီမံကိန်းက ဘာလဲ။ စီမံကိန်း၏ ရည်ရွယ်ချက်။ ဤသုတေသနစီမံကိန်းသည် စစ်တမ်းကောက်ယူလေ့လာသော သုတေသန ဖြစ်ပါသည်။ ရည်ရွယ်ချက်မှာ "မြန်မာနိုင်ငံ ရန်ကုန်မြို့ရှိ ကလေးများတွင်ဖြစ်သော သွားမည်ညာခြင်းနဲ့ ပက်သက်သည့် မိဘများ၏ ဗဟုသုတ၊ သဘောထား၊ အတားအဆီးများနှင့် လက်တွေ့အလေ့အကျင့်" တို့ကို လေ့လာခြင်း ဖြစ်ပါသည်။ အသိပေးသဘောတူညီချက်ကို ပထမ စာမျက်နှာတွင် သဘောတူညီချက်ကို ဘယ်လို တောင်းခံမှာလဲ။ သဘောတူညီချက်အား Google Form ၏ အရှေ့ဆုံး စာမျက်နှာတွင် တောင်းခံသွားမည် ဖြစ်ပါသည်။ ဖော်ပြထားပါမည်။ ဒီလေ့လာမှုမှာ ဘယ်သူတွေ ပါဝင်နိုင်သလဲ။ ယခု လေ့လာမှုတွင် လူဦးရေ အယောက် ၃၈၅ ခန့်အား Google Form ဖြေဆိုရန် ကြိုးစား သွားမည် ဖြစ်ပါသည်။ ပါဝင်ဖြေဆိုသူများသည် မြန်မာနိုင်ငံအတွင်း မြန်မာနိုင်အတွင်း ရန်ကုန်မြို့ရှိ အသက် ၂၀မှ ၅၀ အတွင်းရှိ ဖခင်နှင့် မိခင်များကို စစ်တမ်းကောက်ယူမည်ဖြစ်ပါသည်။ ထိုမိဘများမှာ မိမိရင်သွေးနှင့် အနည်းဆုံး ၆လခန့် ရန်ကုန်မြို့၊ မြန်မာနိုင်ငံတွင်နေထိုင်သည့်သူများဖြစ်ရပါမည်။ သင့်အနေဖြင့် သုတေသနတွင် ပါဝင်နိုင်ရန် ကိုက်ညီမှု ရှိမရှိ စိစစ်မေးခွန်းများကို ဦးစွာဖြေဆိုရန်လိုအပ်ပါသည်။ အကယ်၍ စိစစ်မေးခွန်းလွှာရှိ

အချက်အလက်များနှင့် ကိုက်ညီခြင်းမရှိပါက ကံမကောင်းစွာဖြင့် ယခု သုတေသနတွင် ပါဝင်ခွင့်ရရှိမည် မဟုတ်ပါ။

သင့်အနေနဲ့ ဒီ သုတေသနမှာ ပူးပေါင်းပါဝင်ရမှာလား?

အခုလေ့လာမှုမှာ ပူပေါင်းပါဝင်တာဟာ မိမိဆန္ဒအလျောက် ပူးပေါင်း ပါဝင်တာမျိုးဖြစ်ပါတယ်။ အခုလို ပူးပေါင်းပါဝင်ဖို့ ဖိတ်ခေါ်တာကို သင့်အနေနဲ့ လက်မခံလို့လည်း ရပါတယ်။

ပူးပေါင်းပါဝင်ရန် မဆုံးဖြတ်ခင် Google form ၏ ပထမဦးဆုံး စာမျက်နှာတွင် သင်၏ ခွင့်ပြုချက်ကို အရင်တောင်းခံလိုပါတယ်။ ယခု စာရွက်စာတမ်းအား ဖတ်ရှုနိုင်ရန် ပေးအပ်သွားမည်ဖြစ်ပြီး စစ်တမ်းတွင်ပူးပေါင်းပါဝင်ရန် သင်၏ သဘောဆန္ဒကို မေးမြန်းမည် ဖြစ်ပါသည်။ ထို့နောက် သင်သည် Google Form တွင် စတင်ဖြေဆိုနိုင်မည် ဖြစ်ပါသည်။

သင်၏ သဘောဆန္ဒကို မေးမြန်းခြင်းမှာ ယခု သုတေသနတွင် မပါဝင်လိုပါက သင့်အနေဖြင့် ငြင်းဆန်နိုင်ကြောင်းကို ဆိုလိုခြင်း ဖြစ်ပါသည်။ သင့်ဘက်မှ ပူးပေါင်းပါဝင်ရန် ငြင်းဆိုပါက မဖြစ်မနေ ပူးပေါင်းပါဝင်ရန် မလိုအပ်သည့်အပြင် နောက်ဆက်တွဲ ဆိုးကျိုးတစ်စုံတစ်ရာလည်း မရှိပါ။ ပူးပေါင်းပါဝင်ရန် သဘောတူပြီးနောက်တွင်လည်း သင်၏ သဘောဆန္ဒအတိုင်း ပြောင်းလဲနိုင်ပါသည်။

တကယ်လို့ သင့်အနေနဲ့ ပူးပေါင်းပါဝင်ဖို့ ဆုံးဖြတ်တယ်ဆိုရင် သင့်မှာ

- Google Form ဖြေဆိုခြင်းကို ရပ်တန့်နိုင်ပါတယ်။
- Google Form တွင် ဖြေဆိုခြင်းအား အချိန်မရွေး နှုတ်ထွက်နိုင်ပါတယ်။
- ကျွန်ုပ်တို့ရဲ့ သုတေသနလေ့လာတာတွေနဲ့ ပတ်သက်ပြီး သိချင်တာတွေကို အချိန်မရွေး

မေးမြန်းနိုင်ပါတယ်။

- သင်၏ အမည်ကို အသုံးပြုမည် မဟုတ်ကြောင်း နားလည်သဘောပေါက်မှုနှင့် စပ်လျဉ်းသည့် အသိပေးမှု ပြုလုပ်နိုင်ပါတယ်။
- လေ့လာမှု ပြီးစီးတဲ့အခါ ရှာဖွေတွေ့ရှိချက်အကျဉ်းချုပ်ကို သင့်ကိုပေးမှာ ဖြစ်ပါတယ်။

သင်၏ ဆုံးဖြတ်ချက်များအတွက် အကြောင်းပြချက် တစ်စုံတစ်ရာ ပေးရန် မလိုအပ်ပါ။ ထို့အပြင် သင်အပေါ် နောက်ဆက်တွဲ အကျိုးသက်ရောက်မှု သို့မဟုတ် ဆိုးကျိုး တစ်စုံတစ်ရာ ကျရောက်မည် မဟုတ်ပါ။ ယခု လေ့လာမှုနှင့် စပ်လျဉ်း၍ သင့်အနေဖြင့် ပြုလုပ်သည့်မည်သည့် ဆုံးဖြတ်ချက်မဆို ကျွန်ုပ်အနေဖြင့် အပြည့်အဝ ထောက်ခံအားပေးပါတယ်။

ဒီလေ့လာမှုမှာ ဘာတွေ ပူးပေါင်းပါဝင်ရမလဲ?

သင့်အနေဖြင့် Google Form မှ တစ်ဆင့် စစ်တမ်းကို ဖြေဆိုရမည် ဖြစ်ပါသည်။ အဖြေမှန်သည်၊ အဖြေမှားသည် မရှိပါ။ ကျွန်ုပ်တို့မှ သင်တို့၏ ရင်သွေးများတွင်ဖြစ်ပေါ်တတ်သည့် သွားမညီညာခြင်းနှင့် သက်ဆိုင်သည့် ထင်မြင်ချက်၊ ဗဟုသုတ၊ သဘောထားနှင့် လက်တွေ့အလေ့အထများကို သိရှိလိုခြင်းဖြစ်ပါသည်။ သင်ဖြေဆိုထားသည့် အဖြေများအား Google Form တွင် သိမ်းဆည်းထားမည်ဖြစ်ပြီး သင်၏ အမည်အား မှတ်သားထားမည် မဟုတ်ပါ။ Google Form မှ လျှို့ဝှက်နံပါတ်တစ်ခုကို ပေးအပ်သွားမည် ဖြစ်ပါသည်။ ဆိုလိုသည်မှာ သင်၏ အဖြေများနှင့် သင်၏ အမည်မှာ ဆက်စပ်သွားမည် မဟုတ်ပါ။ မေးခွန်းအားလုံးဖြေဆိုရန် အချိန် မိနစ် ၃၀-၄၀ ခန့် ကြာမြင့်မည် ဖြစ်ပါသည်။

ယခု သုတေသန ပရောဂျက်တွင် ပူးပေါင်းပါဝင်ဆောင်ရွက်ခြင်းအတွက် သင့်အနေဖြင့် ငွေကြေးတစ်စုံတစ်ရာ

ကုန်ကျရန် မလိုပါ။ ယခု ကဲ့သို့ အချိန်ပေးပြီး သင်၏ အတွေ့အကြုံများအား ဖြေကြားပေးခြင်းအတွက် ကျွန်ုပ်မှ ကျေးဇူးတင်သည့်အနေဖြင့် အင်တာနက် ထောက်ပံ့ကြေး ပံ့ပိုးပေးမည် ဖြစ်ပါသည်။

ဤလေ့လာမှုတွင် သင်ပါဝင်ပါက အန္တရာယ် သို့မဟုတ် အန္တရာယ်ဖြစ်နိုင်သော အခြေအနေများ ရှိပါသလား။

- ဤလေ့လာမှုတွင် သင်ပါဝင်ပါက အန္တရာယ် သို့မဟုတ် အန္တရာယ်ဖြစ်နိုင်သော အခြေအနေများ မရှိပါ။ အထက်တွင် ရှင်းပြထားသည့်အတိုင်း ဤလေ့လာမှုသည် ဖွဲ့စည်းတည်ဆောက်ထားသော မေးခွန်းလွှာကို အသုံးပြု၍ အင်တာဗျူးတစ်ခုဖြစ်သည်။ ပါဝင်သူများကို အန္တရာယ်ဖြစ်စေနိုင်သော လုပ်ထုံးလုပ်နည်းများ သို့မဟုတ် လုပ်ဆောင်မှုများ မရှိပါ။

ဒီသုတေသနရဲ့ အကျိုးကျေးဇူးတွေက ဘာတွေလဲ။

- လက်ငင်း အကျိုးအမြတ်အနေဖြင့် ပါဝင်ဖြေဆိုသူများသည် ၎င်းတို့၏ ကလေးများတွင်ဖြစ်တတ်သော သွားမည်ညာခြင်းနှင့် ပက်သက်သည့် ဗဟုသုတ၊ သဘောထားနှင့် လက်တွေ့အတွေ့အကြုံများကို မျှဝေပေးနိုင်မည်ဖြစ်ပါသည်။

- ပါဝင်ဖြေဆိုသူများအနေဖြင့် မိမိရင်သွေးများ၏ သွားမည်ညာမှု ကုသခြင်းကို တားဆီးထားသည့် အတားအဆီးများကို ဖော်ပြသွားနိုင်မည်ဖြစ်ပါသည်။

- ဤ သုတေသန၏ ရှာဖွေတွေ့ရှိချက်များမှ တစ်ဆင့် သွားမည်ညာခြင်းသည် သွားဘက်ဆိုင်ရာ ပြည်သူ့ကျန်းမာရေးပြဿနာတစ်ခုအဖြစ် ဖော်ပြသွားနိုင်ရုံသာမက သွားမည်ညာခြင်းကို ကာသွယ်ခြင်းနည်းလမ်းများကို ပိုမိုပြုလုပ်နိုင်မည်ဖြစ်ပါသည်။ သွားမည်ညာခြင်း သတိတရားများကိုလည်း မြှင့်တင်ပေးနိုင်မည်ဖြစ်ပါသည်

ပါဝင်သူများသည် ဤသုတေသန၏ တွေ့ရှိချက်များကို မည်သို့ သိရှိနိုင်မည်နည်း။

လေ့လာမှုများ၊ သိပ္ပံဂျာနယ်ထုတ်ဝေမှုများနှင့် သုတေသီ၏ ကျမ်းပြုစာမေးပွဲများ ပြုလုပ်ပြီးနောက် လေ့လာတွေ့ရှိချက်အကျဉ်းချုပ်ကို သုတေသန စာတမ်းပြုစုသူ ဦး ရဲထက်အောင်၏ Facebook တွင် မြန်မာဘာသာဖြင့် လွှင့်တင်မည်ဖြစ်ပြီး သက်ဆိုင်ရာ မြန်မာနိုင်ငံရှိ သွားဘက်ဆိုင်ရာနှင့် ပြည်သူ့ကျန်းမာရေး အဖွဲ့အစည်းများ/အသင်းအဖွဲ့များ ထံသို့လည်း ဖြန့်ဝေသွားမည်ဖြစ်သည်။ ပါဝင်သူများသည် ဤရင်းမြစ်များတွင် ဝင်ရောက် ကြည့်ရှု နိုင်မည် ဖြစ်သည်။

အကယ်၍ သုတေသီသည် ပါဝင်သူအချက်အလက်စာရွက်နှင့် သဘောတူညီချက်ပုံစံတွင် ဖော်ပြထားသည့်အတိုင်း ပါဝင်သူများကို မလုပ်ဆောင်ပါက၊ ပါဝင်သူများသည် အဆိုပါဖြစ်ရပ်အား လူသားများပါဝင်သောသုတေသနဆိုင်ရာ သုတေသနကျင့်ဝတ်ပြန်လည်သုံးသပ်ရေးကော်မတီ၊ အုပ်စု ၁၊ ချူလာလောင်ကွန်း တက္ကသိုလ် (RECCU) ကျမ်ကျူရီ ၁ အဆောက်အအုံ, အမှတ် ၂၅၄၊ ဖယားထိုင်းလမ်း၊ ပထူဝန် ခရိုင်၊ ဗန်ကောက်၊ စာပို့အမှတ် ၁၀၃၃၀၊ ထိုင်းနိုင်ငံ။ တယ်လီဖုန်း/ ဖက်စ် ၀-၂၂၁၈-၃၂၀၂၊ ၀-၂၂၁၈-၃၀၄၉၊ အီးမေးလ်: eccu@chula.ac.th သို့ တိုင်ကြားနိုင်သည်။

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