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ASSESSING THE USABILITY AND PERCEPTION OF THE INDEX FOR INTERCEPTIVE ORTHODONTICS REFERRAL AMONG DENTAL FRONTLINERS IN SELANGOR AND FEDERAL TERRITORIES OF KUALA LUMPUR AND PUTRAJAYA

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ABSTRACT

Malocclusion is a prevalent oral disorder in children, often manifesting early life development. Timely identification of these developing malocclusion and referral of these cases is crucial for initiating interceptive orthodontic treatment at the appropriate stage. However, dental frontliners face challenges in identifying and referring developing malocclusions timely during the late mixed dentition and early permanent dentition phases due to the lack of standardized guidelines. The Index for Interceptive Orthodontics Referral (IIOR) was recently developed and validated as a tool to guide the timely referral of developing malocclusion that may benefit from interceptive orthodontics. This research seeks to evaluate the reliability, reproducibility, usability and perception of the IIOR among dental frontliners in Selangor, Federal Territories of Kuala Lumpur, and Putrajaya, emphasizing its potential to enhance clinical decision-making and referral practices during dental screening. The objectives of this research were to validate the modified perception questionnaire of IIOR and calibrate the expert standard grading (ESG), to determine the reliability and reproducibility of the IIOR among the dental frontliners and compare the agreement to the expert standard grading. Additionally, to assess the usability and perception of the IIOR among dental frontliners. The validation of the Perception Questionnaire involved 6 experts and was determined using the Content Validity Index (CVI) which comprised of item-content validity index (I-CVI) and scale-level content validity index (S-CVI/Ave) for the content validity. The validation process also involved 12 assessors for Face Validity Index (FVI) which comprised of item face validity index (I-FVI) and scale-level face validity index (S-FVI/Ave). Grading calibration between 3 experts was carried out to determine the Expert Standard Grading by grading study models to be used in the pilot study and main research. A pilot study was conducted to assess the feasibility of the research involving 13 participants from the Faculty of Dentistry, UiTM. The methodology of the main research was for the participants to attend a pre-recorded video briefing on IIOR, then grade 30 study models using the IIOR based on its malocclusion severity and urgency for referral. After grading the study models, they answered a perception questionnaire on IIOR. Then, after 14 days, the participants did a retest to grade the study models. This main research involved 279 dental frontliners who had attempted the perception questionnaire on the IIOR, while 226 dental frontliners were involved in the retest of the grading. The results showed that the perception questionnaire was highly valid with S-CVI/Ave=0.96 and S-FVI/Ave=0.97. There was substantial agreement between the experts for the calibration of the 10 study models in the pilot study and excellent agreement in the main research with 30 study models. The reliability on grading the study models using IIOR was in moderate agreement (K=0.57) among the dental frontliners on the first grading and substantial agreement on the retest (K=0.62). There was substantial agreement between frontliners to the ESG (0.61-0.80) with n=150. The reproducibility showed high level of agreement with n=81 with substantial agreement and n=67 with almost perfect agreement. It revealed that the IIOR had high reliability and reproducibility among dental frontliners and when compared to the expert standard grading. The results from the perception questionnaire proved IIOR to be highly acceptable because it was easy to use, simple to understand, and fast to identify developing malocclusion to be referred for interceptive orthodontics treatment possibility during dental screening.

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CHAPTER 1
INTRODUCTION

1.1 Research Background

One of the most common oral disorders in children is malocclusion (Yu et al., 2019). The prevalence rates vary significantly across different populations, with estimates ranging from 39% to 93% among children and adolescents (Cenzato et al., 2021). Children who develop malocclusion may be treated with early interceptive orthodontics; however, it needs to be detected early (C. Zhou et al., 2024). Interceptive orthodontics involves early diagnosis and treatment of malocclusion, aiming to address potential issues before they progress to severe malocclusions (Almarhoumi & Alwafi, 2024).

The American Association of Orthodontists (AAO, 2020) recommends that children undergo orthodontic screening from 7 years old. Early screening conducted by dentists and orthodontists showed that dentists should screen children aged 7 to 8 years old for early orthodontic treatment (Pietilä et al., 1992). However, Jefferson (2010) suggests that children should get an orthodontic diagnosis as early as 5 years old.

Timely detection and appropriate referral of children with developing malocclusion requiring interceptive orthodontic treatment are crucial (Elfseyie et al., 2020; Wong et al., 2004). Early identification of malocclusions, such as anterior and posterior crossbites, can prevent future complex treatments (Almarhoumi & Alwafi, 2024). Children with increased overjet in Class II malocclusion may be treated early to avoid trauma to the incisors. Treatment can also reduce the severity of the malocclusion (O'Brien et al., 2003), apart from the complexity of the orthodontic treatment later. Cases such as impacted canines may be treated by timely extraction of deciduous canine which could facilitate spontaneous eruption if detected early (Naoumova et al., 2014). The early assessment of the impacted canine will warrant early referral for interceptive treatment and could prevent any surgery and complex treatment in the future (Counihan et al., 2013).

In contrary, a study in England showed that 76 % of patients with impacted canine who were supposed to be referred by age 12 years, were referred late (Patel &