**Relationship Between Prosthodontic Treatment Awareness with Number and Position of Tooth Loss**

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**Abstract**

Objective: This study was conducted to determine the status of tooth loss and perception of patients’ awareness about prosthodontic treatment in adults with emphasis on number of tooth loss and their position in mouth. Edentulism and partial tooth loss still represent a significant health concern among Indonesian adults. Individual perception of potential reason of treatment selection was the most consequential determinants of patients’ decisions to treat condition of tooth loss, predicated on level of patient’s awareness.

Methods: This study was done using a convenience sampling on patient age of 20 years and above with one or more missing teeth except the third molars. Patients were clinically evaluated and answered questionnaire about self-awareness of prosthodontic treatment. This research design was cross sectional and analyzed with Kruskal-Wallis and Mann Whitney test ($\alpha = 5\%$).

Results: Clinical factors like number and position of tooth loss and other socio-demographic factor like age were associated to patient’s awareness of prosthodontic treatment.

Conclusion: Based on these evidences, we suggested that in general, the dentist must spend more time to increase patient awareness on the consequences of tooth loss to motivate patient regarding the need of a denture and leading them to demand prosthodontic treatment.

Keywords: adults, awareness, kruskal-wallis, prosthodontics, tooth loss

**Introduction**

Although many industrialized countries have experienced a dramatic reduction in prevalence of edentulism and partial tooth loss, the proportion of tooth loss in developed countries continues to be significantly high.¹² The Indonesian Basic Health Research (RISKESDAS) 2007 showed that in age group of 35-44 years old, the average number of tooth loss or was indicated of extraction (M-T) was considered high which was 2.89 and reaching 3.35 in 2013. There was a tendency to incline percentage of people who had tooth loss along with the increasing age. In group of elderly group aged 65 or older, the component of missing teeth (M-T) was 16.99 per person reported in 2007 and continue to increase for about 17.05 in 2013.³⁴

The main causes of tooth loss include the sequelae of caries and periodontal disease, but other factors have also been implicated.¹ Loss of teeth significantly impairs oral function and masticatory efficiency. Once a sufficient number of teeth are missing, food choices and nutritional changes could contribute to medical problems that might affect an individual’s general well-being.² Tooth loss can also have a negative impact on oral health related quality of life (OHQoL) due to unplaced missing teeth, and different levels of prostodontic intervention such as removable partial dentures (RPD’s), fixed dental prosthesis (FPD’s), implants, complete dentures, or over dentures are needed as a standard of care to improve condition of edentulous patients.⁵⁷

Substitution of missing teeth with prosthesis is infrequent in developing countries, even though a high proportion of individuals may require some sort of prosthetic replacement.¹ Due to lack of awareness about maintaining the function of teeth and the importance of prostodontic replacement, mostly patient do not seek treatment immediately.³ In India, the unmet need to replace missing teeth in partially dentate patients was as high as 90% with a large number of elderly citizens having health and dental problems.² The unmet need for dental care was relatively high. Recent surveys conducted on the prosthetic status of Indonesian
population revealed that only 4.6% people rehabilitate their missing tooth by using some type of prosthesis while others not wearing any.9

Individual perception of potential reason of treatment selection was the most consequential determinants of patients’ decisions predicated on knowledge, awareness and motivation.10 Self-awareness refers to the capacity of becoming the object of one’s own attention. In this state, one actively identifies, processes, and stores information. Self-awareness represents attitude is a complex multi-dimensional phenomenon that comprises various self-domains and varies from one individual to other, and often difficult to change.6-11 Interventions to support behavior change tend to be more successful when theory is used rather than when it is not. The trans theoretical model (TTM), the most popular stage model in health psychology – has proven successful with a wide variety of simple and complex health behaviors. This theory described the shifts in attitudes, intention, and behaviors happen from where people have no intention of taking action because lack of awareness and information through modify their behaviors to overcome their problem and demand for a treatment.12

Knowledge and awareness of subjects regarding prosthodontic treatment may play a role in their acceptance of prostheses.10 Generally, the three major areas that determine acceptability of treatment are comfort, function, and esthetics. Mechanical and biological factors determine comfort and function. However, a variety of social and cultural influences, attitudes, and beliefs may determine patients’ acceptance of the esthetic aspects of prosthodontic treatment.7 Studies show that majority of patients are concern with the replacement of missing anterior teeth more than posterior teeth. Esthetics are given much more importance than function.8 Clinical factors, like number and location of absent teeth, age, gender, impaired function, discomfort and dissatisfaction with appearance, and other socio-demographic factors, cultural, and financial determinants are known as important ingredients to motivated individual to cope with tooth loss and, as consequence, essential aspect of clinical decision making.13

However, awareness among individuals about impairment of oral functions followed by tooth loss and preference of awareness for prosthodontic treatment has not been investigated. The aim of this study was to determine status of tooth loss and perception of patients’ awareness about prosthodontic treatment with number and position of tooth loss.

Methods

This study was a cross-sectional study conducted in local population and more specifically of patients visiting Dental Teaching Hospital Universitas Indonesia (RSGM-P FKG UI). The sample of this survey were taken consecutively of adults and elders (aged 20 years and above), were eligible to participate. All patients with at least one tooth missing due to oral disease (excluding third molars) had the opportunity to participate in the study. The study had the approval by the Ethical Commission of Faculty of Dentistry, Universitas Indonesia and individuals signed an informed consent form to participate in the study.

In this test, was piloted on a sample of 5 adult patients and interviewed by the examiner in order to check their understanding of questionnaire and how long it would take to interview each person. Measures by the examiners demonstrated excellent agreement, with an interclass correlation coefficient of 0.951 based on repeated measurements. Dental examination for counting missing teeth was evaluated using dental mirror and performed in the dental chairs. Demographic information was recorded by the subjects. The questionnaire consisted of questions to obtain age, gender, level of education and evaluate patient’s awareness of prosthodontic treatment. Further, the questionnaire concentrated on questions sought to help determine awareness among patient on tooth replacement was collected and measure using a questionnaire developed by Nurilhasari (2012).14 The participants were asked if they felt an importance in each item of questionnaire and every question consist of five possible answers, not important (0), somewhat important (1), moderately important (2), important (3), and very important (4). A score was created adding each item resulting in discrete variable ranging from 0 to 20. The questions focused to decide patient awareness of importance to rehabilitate tooth loss for different reason such as mastication, phonetic, esthetic, self-esteem, and difficulty to concentrate.14

Tooth loss was the main explanatory variable and was measured using an ordinal scale, based on tooth position and number of missing teeth, which was developed by Batista et al.6 For the classification, Batista et al considered tooth loss due to oral disease. The tooth loss classification was, (0) no tooth lost due to caries or periodontal disease, (1) loss of 1 to 4 first permanent molars, (2) loss of up to 12 posterior teeth, excluding subjects who had lost only the first permanent molars, (3) loss of up to 12 teeth including an anterior tooth, (4) loss of more than 12 teeth (13-31), (5) edentulous. This classification intends to measure tooth loss functionally and esthetically considering qualitative data (position of missing teeth) and quantitative data (number of missing teeth).5

Statistical analysis was statistically analyzed using the SPSS version 20. Frequencies were generated and mean calculated with standard deviation using descriptive statistical analysis. Kruskal-Wallis and Mann Whitney test was used to identify significance (α = 5%).

Result and Discussion

The study samples of 100 subjects were included in the study to determine patient’s awareness of prosthodontic treatment among patients visiting Dental Teaching Hospital Universitas Indonesia (RSGM-P FKG UI). The study sample consisted of 52% males (n = 52) and 48%
females and most of patients (43%) belonged to the middle-age adults (40-59 years). With respect to educational level factors, 27% having a low education, 41% had finished a high school education, and 32% are bachelor’s degree or higher. Other sample characteristics are shown in Table 1.

Table 1. Characteristics of the sample in accordance with the level of awareness prostodontic treatment

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
<th>Median(min-max)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tooth Loss</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss 1-4 first molar only</td>
<td>24</td>
<td>24</td>
<td>9 (0-16)</td>
<td>0.000**</td>
</tr>
<tr>
<td>Loss up to 12 posterior teeth, excluding first molar</td>
<td>41</td>
<td>41</td>
<td>13 (5-20)</td>
<td></td>
</tr>
<tr>
<td>Loss up to 12 teeth, including an anterior tooth</td>
<td>14</td>
<td>14</td>
<td>15 (6-19)</td>
<td></td>
</tr>
<tr>
<td>Loss of more than 12 teeth and edentulous</td>
<td>21</td>
<td>21</td>
<td>16 (13-20)</td>
<td></td>
</tr>
<tr>
<td>Position of Tooth Loss</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Posterior</td>
<td>65</td>
<td>65</td>
<td>12 (0-20)</td>
<td>0.000**</td>
</tr>
<tr>
<td>Anterior and Posterior</td>
<td>35</td>
<td>35</td>
<td>15 (6-20)</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
<td>0.000**</td>
</tr>
<tr>
<td>‘Young’ adults (20-39)</td>
<td>37</td>
<td>37</td>
<td>12 (0-19)</td>
<td></td>
</tr>
<tr>
<td>‘Middle age’ adults (40-59)</td>
<td>43</td>
<td>43</td>
<td>14 (0-20)</td>
<td></td>
</tr>
<tr>
<td>Elderly (≥60)</td>
<td>20</td>
<td>20</td>
<td>15 (6-20)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td>0.013*</td>
</tr>
<tr>
<td>Male</td>
<td>52</td>
<td>52</td>
<td>15 (5-20)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>48</td>
<td>48</td>
<td>13 (0-20)</td>
<td></td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
<td></td>
<td></td>
<td>0.482*</td>
</tr>
<tr>
<td>Less than a high school diploma</td>
<td>27</td>
<td>27</td>
<td>13.5 (0-20)</td>
<td></td>
</tr>
<tr>
<td>High School Graduates</td>
<td>41</td>
<td>41</td>
<td>14 (0-20)</td>
<td></td>
</tr>
<tr>
<td>Bachelor’s degree or higher</td>
<td>32</td>
<td>32</td>
<td>15 (6-20)</td>
<td></td>
</tr>
</tbody>
</table>

* Kruskal-Wallis analysis; Significance level p value < 0.05  
** Mann-Whitney analysis; Significance level p value < 0.05

Figure 1. The mean level awareness of prostodontic treatment in each domain

The ordinal classification for tooth loss used in this study allows for measuring the number of teeth lost and their position in the same variable. The median level awareness of prostodontic treatment for the subject who has loss 1-4 first molar was 9 (0-16), loss up to 12 posterior teeth was 13 (5-20), loss up to 12 teeth including an anterior tooth was 15 (6-19), and in loss more than 12 tooth group was 16 (13-20).

Gradients in awareness increased according to the number of teeth lost and their position as per the tooth loss classification. According to Table 1, the subjects whose loss up to 12 teeth and edentulous, had a higher awareness for tooth replacement with prosthetic treatment. Patient with lost up to 12, including an anterior tooth were more likely to present higher scores on awareness than those who had loss 1-4 first molar only and who had up to twelve missing, but only posterior teeth which still have an adequate contact occlusion to supporting mastication. This fact may show the importance of esthetics and appearance related to tooth loss as seen in Figure 1. According to the result in Table 1, there was a significant correlation found between number of tooth loss and their related position in mouth with patients’ awareness of treatment needs (p = 0.000) and is in agreement with findings of Elias et al in Brazil. They reported the presence of an intacantanterior sextant and at least three premolars in occlusion are the best predictors of patient’s satisfaction. This finding is in line with several researcher’s finding that clinical aspect like anterior position would increase motivation for treatment. Elias and Sheiham conducted a review of literature and found that, in general, patients were more likely to seek replacement of missing anterior tooth than a posterior tooth, and rated aesthetic above function in their priority for tooth replacement. It is easy to appreciate the very negative effect of tooth loss of an anterior tooth in terms of self-confidence and aesthetic. Replacement of missing posterior teeth and cosmetic dental treatment in general, depends on the perception of the patient. Even in countries with highly developed dental care systems, open spaces in the premolar and molar regions are well accepted by people of all ages. The prospect of a good esthetic result frequently motivated the patient to wear a new denture and esthetic can be more important than function for many individuals to improve the individual’s social status.

Since patients perceived wide ranges of dental treatment, it was assumed that not only clinical aspect of tooth loss influence treatment needs. We need to mention that gender and age can influence self-perception of impact and prostodontic treatment. With respect to socio-demographic factor, the bivariate analyses for both outcomes showed, there was highly significant among different age groups in relation to level of treatment awareness between older patients, which have a high willingness to replace the missing tooth, despite losing significant numbers of teeth, as compared to those who were young (p < 0.05). Singh et al concluded that older subjects felt more disadvantaged by tooth loss than younger ones due to the difficulty in mastication which impact in food choices and nutritional changes that might affect an individual’s general well-being. Finding a solution to the problem of health inequalities is a significance challenge, but it is fundamental than strategies are implemented to reduce the disease burden and improve access to care. Idrees et al found, males tend to have a higher perceived need and expectations for...
prosthodontic treatment both esthetically as well as functionally than females, whereas females were mostly not clear about their expectation. This finding indicates mostly females who become their subjects had a very little dental knowledge and dental awareness because most of females were working at home only.17 Similarly, in this study, considering the relatively larger population of males who had a tooth loss due to oral disease and have awareness for replacement would also indicate greater awareness among the males.

Dental health perceptions may not only depend on one’s sensitivity to sign of disease, but also may be influenced by an individual’s knowledge of dental health. Schützhold et al found that educational status background are also critical factors to increase awareness about dental prosthesis. They reported that patients having higher education showed better dental prosthesis awareness, which is similar to this study. The result of this study as a majority of the patients reported from patients were low educated. The higher number of low educated and socio-economically insecure patients as well as the prevalence of tooth loss reflects lack of awareness about maintaining the function of tooth and dental treatment is obviously given the go-by till tooth loss occurs.19 Those who have attained higher levels of education are more possible to have greater financial opportunity and to place a higher priority on dental health. Lack of education about the importance of oral health, the need for preventive service, and the consequences of neglect appear to constitute a significant barrier to dental health care.7-9

Attitudes are not taught but caught or acquired by social interaction.20 The task of health behavior and health education is both to understand health behavior and to transform knowledge about behavior into effective strategies for health enhancement. The subjective dental assessment approach could be used to prioritize those in need of dental care. Moreover, this approach provides a realistic estimation, since those who experience no perceive impact may not demand dental treatment.

The limitation of this study is that it was conducted only on patients visiting Dental Teaching Hospital Universitas Indonesia (RSGM-P FKG UI) and was not representative of the general population and hence the results cannot be generalized to the whole population. There is therefore, the need for an extensive work on the topic to give a broader view on the subject.

Conclusions

Nevertheless, within this limitation of the present study, the following could be concluded. The number of missing tooth and their related position in mouth had a significant correlation with patient’s awareness of prosthodontic treatment. A socio-demographic factor like age also had a significant correlation with awareness for prosthodontic treatment. The study suggested that in general, the dentist must spend more time on chair side during examination to increase patient awareness and the consequences of tooth loss to motivate patient regarding the need of a denture and leading them to demand prosthodontic treatment.

References

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