

Dental student's considerations on complete denture failures. A pilot questionnaire survey

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ABSTRACT

Introduction. Dental students' considerations on the causes of treatment failure is an important issue for the teachers in understanding their medical reasoning. The research analyzed a broad variety of probable causes and contributing factors for complete denture failure that could concern both the patient and the dentist. The method ensured a thorough investigation of the factors that could affect complete denture treatment outcomes.

Method. A questionnaire-based investigation was done among 50 dental students in their last year of Dental Medicine at the University of Medicine and Pharmacy "Iuliu Hatieganu" Cluj-Napoca, Romania. The subjects, both males and females, ranged between 24 to 45 years and were all in their final year of study. They were randomly chosen to represent a wide range of subjects.

Results. The findings revealed that a vast majority of participants, 72%, believed the patient's psychological profile and mental state were key factors in complete denture failure. Inaccurate determination of the jaw relationships was the most significant factor contributing to complete denture failure regarding challenges associated with the fabrication process, according to the respondents (28%).

Conclusions. The majority of respondents thought that patient-related factors, particularly those involving the patient's emotions and psychological profile, were the most important in the failure of complete dentures. Proper assessment of the jaw relations and occlusal deficiencies were the main variables when assessing the reasons for complete denture failures related to the fabrication process.

Keywords: complete denture failures, complete denture deficiencies, complete denture errors

INTRODUCTION

In the ever-evolving field of dentistry, complete denture remains a crucial component of oral rehabilitation, serving as a cornerstone for restoring function and aesthetics in edentulous patients [1,2]. However, the effectiveness of complete dentures is dependent upon various factors, including design, material selection, clinical expertise, and patient cooperation [3]. Overcoming issues related to complete denture failures requires an understanding of the perspectives of dental students, who will be the future guardians of oral health [4-6].

With the appropriate anatomy, pathology, and psychology knowledge and the necessary skills, the dentist should be able to diagnose soft tissue reactions (normal and pathological) and distinguish be-

tween a real local problem and the patient's physical and mental problems [7].

Understanding the structure and traits of the oral mucosa, bones, and tissues that support and surround the denture is essential for successful therapy. The resistance of the residual ridges (bone-mucosa) to the vertical motions and stresses of the denture on the residual ridge determines the complete denture's stability. To have the desired support, the bases of the complete denture must be in harmony with their underlying tissue, and, on the other hand, the occlusion must be appropriately determined [8].

Problems in complete denture treatment related to bones include alveolar bone resorption, sharp edges of crestal bone (exostoses) and of the mylohyoid ridge, and sore mouth. Unfavorable mechanical

forces and improper pressures of the denture base will affect blood nutrition and cause inflammatory and degenerative diseases [9]. The highest amount and rate of bone resorption occurs in the first six months after tooth extraction [10], because the mucosal layer under the denture gradually contributes to bone resorption [11]. The instability of the denture will lead to the resorption of the residual ridges [12].

Because of the incompatibility of the tissue under the denture with the materials used in the denture base, the type of material chosen for the denture base might also produce mucosal alterations. Thickening of the epithelium occurs most often in the reticulate area and on various soft tissue areas, and diverse microorganisms might be identified [13]. A ridge with more elastic and thicker mucosa generates less discomfort than a ridge with smaller alveolar bone and less connective tissue from a prosthetic perspective [14,15].

Even while dentists make every effort to apply the essential rules when manufacturing a complete denture, difficulties may develop during the fabrication stages with an unknown origin [16].

This study aimed at analyzing and comparing dental students' perspectives on patient and dentist-related factors that may lead to full denture failures. The study investigates dental students' opinions, concerns, and novel perspectives on complete denture failures using a pilot questionnaire. It not only sheds light on the current state of dental education but also paves the way for crucial advancements in clinical practice. Our objective is to bridge the gap between academic learning and real-world patient care, empowering future dentists with the insights necessary to enhance complete denture outcomes.

METHODS AND MATERIALS

A questionnaire-based study was performed among 50 final-year dentistry students both males and females and ranged between 24 to 45 years, from the Faculty of Dental Medicine, University of Medicine and Pharmacy "Iuliu Hatieganu" in Cluj-Napoca, Romania. The study was approved by the Medical Ethical Committee of "Iuliu Hatieganu" University of Medicine and Pharmacy in Cluj-Napoca, Romania (number: 174/10.07.2023). A survey was designed for dental medical students to assess their opinions on the causes of total denture failures. The subjects who voluntarily participated included both males and females in their final year of Dental Medicine studies, ranging in age from 24 to 45 years. A sample of 50 dental medical students was chosen at random to represent a wide range of students. This randomly selected sample of participants ensured that the perspectives and experiences of complete denture failure were thoroughly investigated. The questionnaire was created to find out

dental students' opinions on the reasons for full dentures failures. The participants received an online questionnaire with six multiple-choice questions and one descriptive question (Annex 1). The survey's questions were carefully created to address a broad variety of probable causes and contributing factors that could affect both the patient and the dentist, to enable a thorough investigation of the problem, covering various factors that could affect the treatment with complete dentures. Questions on patient-related causes, dentist-related causes, prevention strategies, and individual experiences with full denture failure have been included in the survey questionnaire.

The questionnaire also aimed to learn more about the preventive measures that participants believed were essential to avoiding full denture failures linked to patient-related problems. The respondents were given a list of probable criteria and asked to rate their significance. These factors included accurate anamnesis, paying special attention to the patient's preferences, earning the patient's trust, comprehending the patient's mental and psychological conditions, and providing the patient with the necessary advice following delivery. An additional category labeled "others" was added to the list to account for any additional preventive factors that the participants considered important.

The questionnaire also was aimed at finding what participants considered to be the primary cause for complete denture failure in regard to the difficulties encountered during the fabrication process. Participants were given a list of potential reasons, which included insufficient retention, improper jaw relation determination, incorrect position of the artificial teeth, incorrect occlusal plane determination, unstable occlusion, and an unspecified "others" category. We were able to learn more about the participants' perspectives on the main reasons for complete denture failure as well as their understanding of the problems dental students encounter during the manufacturing process using these questions.

RESULTS

The survey included 50 Dental Medicine students, from the Romanian, English, and French Departments, 25 males and 25 females, carefully chosen to reflect a ranging diversity of individuals, including male and female subjects aged 24 to 45 years, all in their final year of education.

The findings revealed that a sizable majority of respondents (72%) believed that the patient's psychological profile and mental condition were key factors in complete denture failure (Figure 1).

This showed that while physical variables might be important, patient expectations and feelings may be more important.

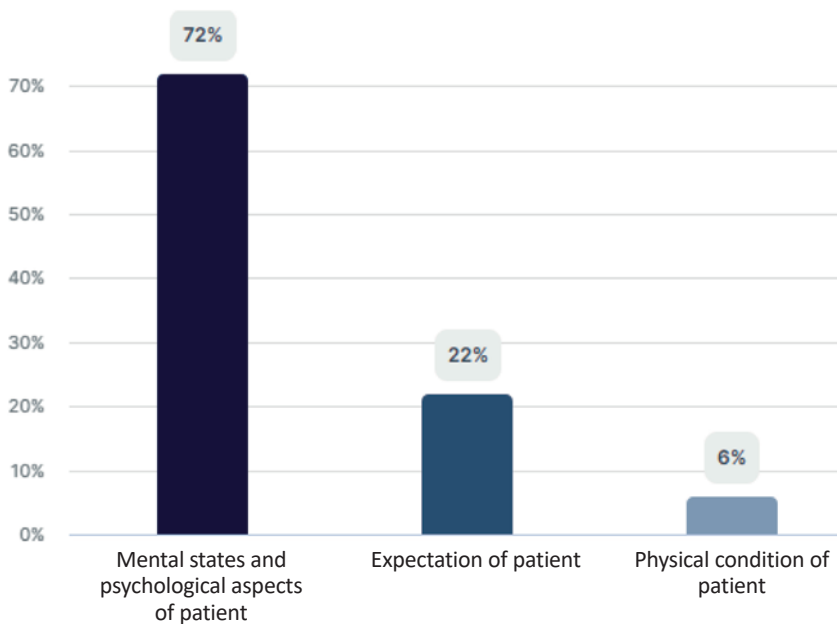


FIGURE 1. Students' considerations on the causes of complete denture failures related to the patient

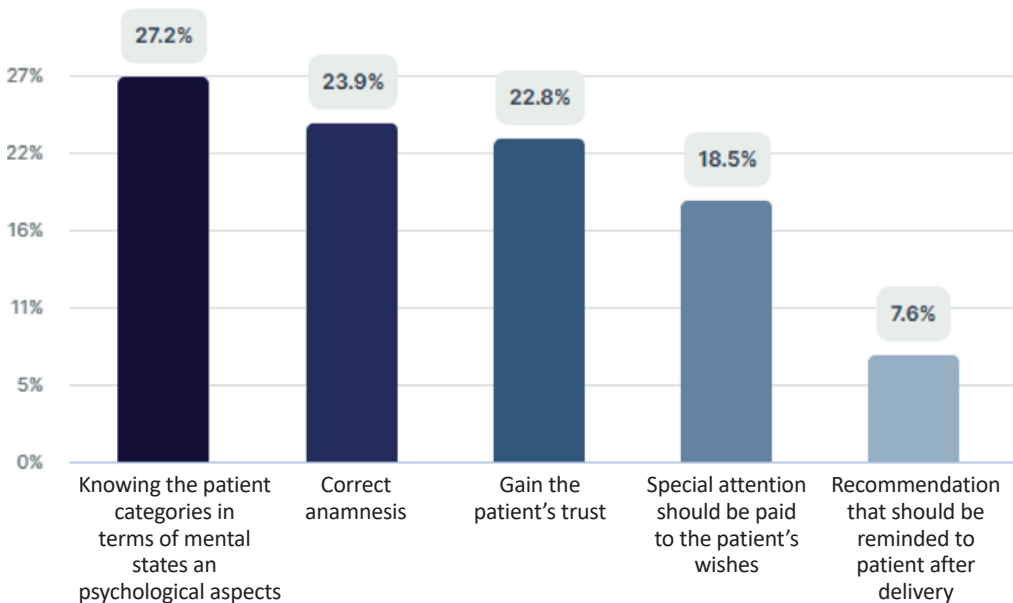


FIGURE 2. Students' answers regarding preventing factors of complete denture failures due to issues related to patients

Figure 2 displays the criteria (in descending order) based on the percentages given after evaluating the query and the specified causes for preventing complete denture failures brought on by patient-related issues. Knowing the patient categories in terms of mental states and psychological aspects: 27.2%. This factor received the highest percentage (27.2%) among the options listed. According to the respondents, understanding the mental states and psychological aspects of the patient is considered the most important factor in preventing complete denture failures.

The answers regarding the most significant reasons for complete denture failure related to challenges in the process of fabrication by the dentist, mentioned by the students, are presented in Figure 3. According to the respondents' assessments, the lack of accurate determination of the relationship be-

tween the jaws is perceived as the most crucial cause of complete denture failure related to difficulties in the fabrication process by the dentist. This is followed by occlusal imbalance, not correctly determining the occlusal plan, not having proper retention, and not properly arranging the artificial teeth.

The possibilities mentioned by dental students for preventing complete denture failures caused by dental-related difficulties are presented in Figure 4.

The majority of dental students (30.6%) believed that proper assessment and identification of jaw relations in centric occlusion were crucial in preventing full denture failures. According to the dental students' responses, accurate evaluation and correct determination of jaw relationships in central occlusion and the correct determination of the occlusal plan are seen as the most important factors for pre-

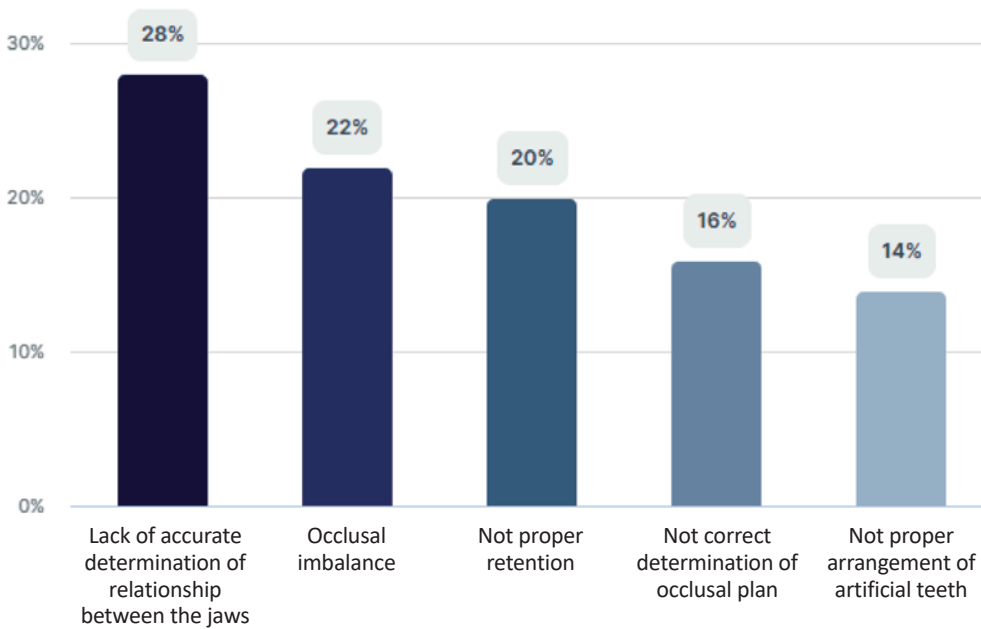


FIGURE 3. Students’ considerations on the causes of complete denture failure related to the dentist

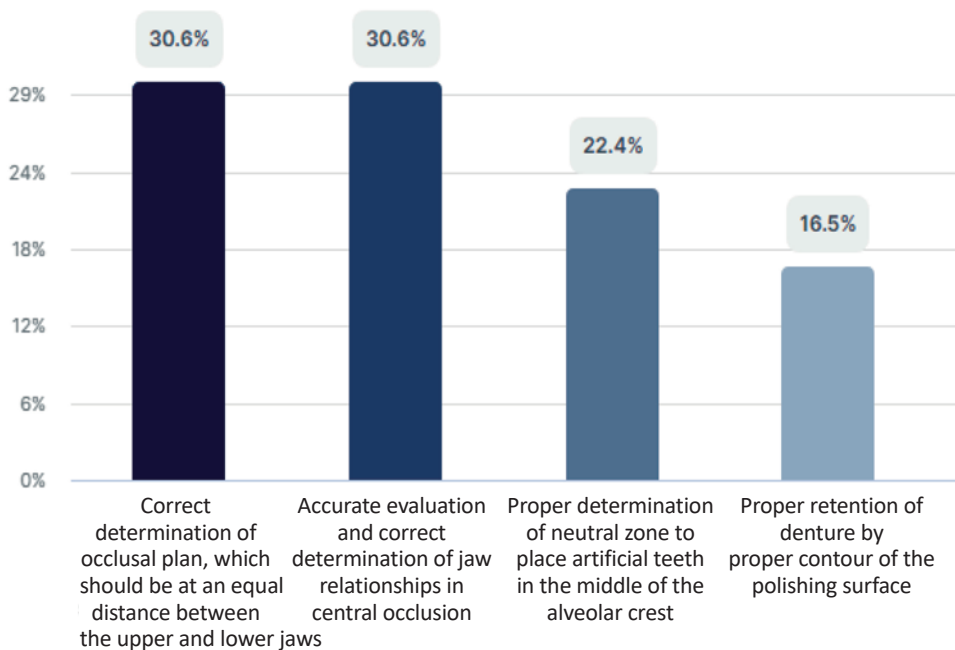


FIGURE 4. Students’ answers regarding preventing factors of complete denture failures due to issues related to dentist

venting complete denture failures related to issues related to the dentist. The proper determination of the neutral zone is considered significant but to a lesser extent, while proper retention of the denture through the polishing surface contour is perceived as relatively less crucial.

DISCUSSION

In this study, the opinions of 50 students were investigated regarding what they believed to be potential patient and dentist-related causes of complete denture failures. After compiling the data, we identified the respondents' perceptions about the factor that patients thought was most essential in

causing complete denture failure. In the study, we additionally inquired into factors that can help prevent complete denture failures linked to issues with patients and dentists. Most of the respondents (72%) claimed the patient's psychological personality and mental state were among the most important variables in deciding whether a complete denture would be successful. Additionally, only 6% of participants thought that the patient's medical condition caused the problem, while 22% thought that patient expectations were the primary cause of failure.

According to House's classification, patients are divided into four categories in terms of mental state and psychological types: philosophical patients (pa-

tients who trust their doctor, and accept the dentist's recommendations and treatment plan), exacting or critical patients (patients that have doubts about the operator, and they also doubt the treatment), hysterical or skeptical patients (having a history of multiple failed treatments, these patients believe that no treatment will be successful for them) and indifferent patients (patients that do not consider the dentures and the treatment with dentures as being important) [17]. In general, edentulous individuals of any age or condition had various expectations from dentures, based on their needs, with each expectation possibly being more significant for some patients than for others. It is important to evaluate the wishes and expectations of each patient before starting the treatment. In each situation, specific consideration should be given to the patient's requests, of course, within the parameters of the basic principles for complete denture fabrication. These reasons include restoring chewing (mastication) and nutritional status, loss of esthetic, speech, and social reasons. The patient's capacity to use the denture for better speech, mastication, and other bodily functions, as well as aesthetic and physiological aspects and the patient's condition, will all have an impact on how well the complete denture is accepted and adapted by the patient [18].

It takes at least two to three months for the patient to acquire the necessary skills for satisfactory chewing and stability of the denture. The patient should start chewing with relatively soft foods and in small pieces. Chewing should be done simultaneously on both sides of the mouth [19]. To have natural speech, the patient should read aloud and repeat the words or phrases that are difficult for him to pronounce [20]. The recommendation to perform good hygiene is necessary and important, and lack of hygiene can cause edema and hyperplastic reactions. Chronic candidiasis and bad breath also occur due to a lack of hygiene. The patient should wash the denture at least 2 times a day with a toothbrush or special brushes, and if possible, wash them with water after every meal [21-23]. Patients are advised to have regular oral examinations because the health of the oral mucosa and the condition of the prostheses need regular examinations. The patient should be examined by a dentist at least once a year.

When considering the causes of complete denture failures related to difficulties in the fabrication process by the dentist, the survey revealed that accurate determination of the relationship between the jaws and occlusal imbalance were identified as the primary factors. Other factors such as proper determination of the occlusal plane and retention were also recognized but to a relatively lesser ex-

tent. Similarly, when examining the factors for preventing complete denture failures related to the dentist, accurate evaluation, and determination of jaw relationships in central occlusion, and the correct determination of the occlusal plane were considered the most crucial by the respondents. This suggested that the students were aware of how crucial precise jaw alignment in central occlusion was to achieve positive results with dentures.

Understanding and awareness of the variety of parameters, including mechanical, biological, and physical factors that are beneficial for denture retention and stability, is necessary for the successful construction of a complete denture and the identification of the causes of failure. When selecting the best method and methodology for denture fabrication, dentists should be guided by an accurate grasp and awareness of these factors [24].

This study's importance lies in its potential to promote improvements in dental education, evidence-based practices, and ultimately elevate the quality of life for countless edentulous patients. The data acquired could aid researchers in developing a thorough understanding of dental students' opinions on the causes and prevention of complete denture failure. In addition, the factors associated with both patient- and dentist-related difficulties that reduce the risk of complete denture failure were investigated, as were the participants' judgments of the most significant patient-related reasons for complete denture failure.

CONCLUSIONS

When evaluating the causes of complete denture failures related to difficulties in the fabrication process, the survey indicated that inaccurate assessment of the jaw relationships and occlusal instability were emphasized as the primary determinants. Other factors, like the accurate assessment of the occlusal plane and retention issues were recognized, albeit to a lesser extent.

The majority of dental students indicated that patient-related factors, particularly those pertaining to the patient's mental and psychological health, were among the primary causes of full denture failure.

Patients who are aware of the limits of complete dentures may comply with them more easily since complete dentures are not as effective as natural teeth. To be effective in the clinical workflow, the dentist must have the necessary accuracy and competence during all working steps. Additionally, the students consider jaw relationship determination and registration, occlusal instability and improper tooth placement to be among the most frequent causes of complete denture failures.

QUESTIONNAIRE

1. **Which one do you consider is the most important cause, related to the patient, of complete denture failure?**
 - Expectations of the patient
 - Mental state and psychological profile of the patient
 - Physical condition of patient
 - Others, please detail

2. **What factors, due to issues related to the dentist, do you consider important for preventing complete denture failures?**
 - Correct anamnesis
 - Special attention to the patient's wishes
 - Patient's trust gaining
 - Knowing the patient categories in terms of mental state and psychological profile
 - Specific recommendations for the patient after delivery
 - Others, please detail

3. **Which factor related to the dentist (difficulties in the fabrication process) do you consider the most important cause of complete denture failure?**
 - Lack of proper retention
 - Lack of accurate determination of the jaw relation
 - Incorrect arrangement of the artificial teeth
 - Incorrect determination of the occlusal plane
 - Lack of occlusal stability
 - Others, please detail

4. **What factors related to the dentist do you consider important for preventing complete denture failure?**
 - Proper retention of the denture by the proper contour of the polishing surface
 - Accurate determination and correct registration of jaw relations in centric occlusion
 - Teeth placement in the neutral zone, in the middle of the alveolar ridge
 - Correct determination of the occlusal plane, at an equal distance between the upper and lower jaws
 - Others, please detail

5. **From your point of view, which one is the most important cause of complete denture failure?**
 - Causes related to patient
 - Causes related to dentist
 - Others, please detail

6. **Have you experienced complete denture failure in your patients?**
 - Yes
 - No

7. **If question 6 was yes, please state the cause?**
Please detail

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