ORIGINAL ARTICLE

Assessment of Nutritional Status One Month after Complete Denture Therapy

MUHAMMAD WASEEM ULLAH KHAN[1], ALIYA FATIMA[2], ASIF ALI SHAH[3]

ABSTRACT

Aim: To assess the nutritional status of first time denture wearers, one month after the placement of complete dentures.

Methods: This Descriptive Case Series was carried out in Punjab Dental Hospital, Lahore for 6 months. Non-probability consecutive sampling technique was used to select 165 patients. Conventional Complete Dentures were made and after one month adaptability period Body Mass Index (BMI) and Nutritional Status was assessed using "Nutritional Health Checklist". The data was entered and analyzed on SPSS version 22.

Results: The mean age of patients was 57.28±7.26 years. Male to female ratio was 2.1:1. The mean BMI of patients was 24.97±2.44 kg/m^2. Good nutritional health was observed in 72(43.64%) patients, moderate nutritional health was found in 78(47.72%) patients.

Conclusion: Most of the patients were with good and moderate nutritional health status one month after the placement of complete dentures.

Keywords: Complete Denture, Nutritional Status, Nutritional Health Checklist

INTRODUCTION

A huge proportion of world population is edentulous. In Europe the prevalence of edentulism peaks upto 69% in people over 65 years of age[1, 2]. In United States 37.9 million people are expected to be edentulous by the year 2020 and the situation is even worse for underdeveloped countries[3]. According to the World Health Organization (WHO) criteria, the complete edentulous patient is (1) Physically impaired (2) Disabled and (3) Handicapped[4, 5, 6]. They are at the risk of developing Malnutrition[7,-9], Cardiovascular diseases[10], Type 2 Diabetes Mellitus[11], Rheumatoid Arthritis[12] and Cognitive disorders[13].

Chewing ability of edentulous patients declines after the loss of teeth. They select processed and cooked food rather than fresh foods to compensate for this loss[14]. They have difficulty in eating fruits, vegetables and some form of bread. This can cause an imbalance in dietary intake or decreased bioavailability of nutrients[15]. Conventional complete dentures are the most common and cost effective treatment option for edentulous patients restoring their esthetic, functional and social requirements[16].

Few studies suggest that the prosthodontic rehabilitation of edentulous patients with complete dentures can improve the food choices and diet quality in older individuals[17-20]. Whereas some studies have shown that rehabilitation with dentures did not result in a significant change in the diet quality of these people[21]. The aim of the current study was to check the influence of complete denture therapy on nutritional status of edentates of our population using a questionnaire "Nutritional Health Checklist".

Nutritional Health Checklist is 10 Items questionnaire which identifies the diet quality and nutritional status of patients and contains information regarding ability to chew hard food, meat products, number of meals per day, fruits, vegetables, denture sore mouth, loose dentures, appetite, collection of food particles under the denture and tongue/cheek biting with dentures. All these questions have individual score which was summed to get the final nutritional status.

METHODOLOGY

This Descriptive case series was conducted in de' Montmorency College of Dentistry / Punjab Dental Hospital, Lahore in a period of six months. The sampling technique used was Non probability consecutive sampling. A sample size of 165 patients was calculated with 95% confidence level, 4% margin of error and taking expected percentage of high nutritional risk i.e. 7% (least among all nutritional status) in edentulous patients presenting for complete denture therapy[22].

Patients included in the study were from 45-70 years of age of both genders and they were first time denture wearers. Patient with any physical disabilities which affect oral function e.g. Facial palsy, Parkinsonism and adults with systemic diseases

[1]*Assistant Professor of Prosthodontics,*
[2]*FCPS II Resident Prosthodontics,*
[3]*Professor of Prosthodontics de'Montmorency College of Dentistry. Correspondence Dr. Muhammad Waseem Ullah Khan, Cell # 03334844939 Email # veritarian@yahoo.com*

identified during history and examination e.g. Diabetes mellitus, Hypertension which negatively affect normal denture adaptation were excluded from the study

Study sample of 165 patients fulfilling the inclusion and exclusion criteria was selected from outdoor department of Punjab Dental Hospital Lahore. Informed consent was taken from all patients. Socio-demographic data (Name, Age, Gender, Contact number) was noted and Acrylic Conventional Complete Dentures with anatomic teeth was made according to the standards laid down by de'Montmorency College of Dentistry under the guidance of American College of Prosthodontists and British Society of Prosthodontists.

After one month adaptability period Body Mass Index (BMI) and Nutritional Status was assessed using the questionnaire "Nutritional Health Checklist" which records ability to chew hard food, meat products, number of meals per day, fruits, vegetables, denture sore mouth, loose dentures, appetite, collection of food particles under the denture and tongue/cheek biting with dentures and assigns a score of one for each positive response. The total score was calculated after summing up the individual scores and Nutritional status was classified as good nutritional health, moderate nutritional health and high nutritional risk. The patient with good nutritional health had score between 0-2. The patients with moderate nutritional health had score between 3-5 and patients with high nutritional risk had score 6 or above.

SPSS software version 22 was used to analyze the data (Nutritional health checklist score). The Demographic variables (age and gender) were analyzed using Simple Descriptive Statistics. Age was presented by calculating Mean ± S.D. Frequency and percentage was calculated for gender and nutritional status (i.e., good nutritional health, moderate nutritional health and high nutritional risk) after one month of treatment. Data was stratified for age, gender and BMI to address the effect of modifiers. Post stratification chi-square test was applied to check the significance with p-value ≤0.05 as significant.

RESULTS

Total 165 cases were enrolled in this study. The mean age of the patients was 57.28±7.26 years with minimum and maximum ages of 45 & 70 years respectively. Male patients were 112(67.88%) and female patients were 53(32.12%). Male to female ratio of the patients was 2.1:1. The study results showed that the mean height value of the patients was 5.52±0.41 feet with minimum and maximum heights of 4.1 & 6.3 feet respectively. The study results showed that the mean weight value of the patients was 68.96±6.13kg with minimum and maximum weights of 47 & 82kg respectively. The study results showed that the mean BMI value of the patients was 24.97±2.44kg/m^2 with minimum and maximum BMI values of 20.10 & 32.60kg respectively.

The patients who were unable to chew hard food were 75(45.5%), the patients who bear difficulty to chew meat products were 76(46.1%), the patients who took <2 meals a day due to denture were 50(30.3%), the patients who were unable to eat fruits were 33(20%) and the patients who were unable to eat raw vegetables were 76(46.1%). The patients who develop denture sore were 24(14.5%), the patients who eat less due to lose denture were 28(17%), the patients whom appetite decrease due to denture were 65(39.4%), the patients whom food particles get collected due to denture were 52(31.5%) and the patients who experiences tongue/cheek biting were 22(13.3%) (Table1).

In our study good nutritional health was observed in 72(43.64%) patients, moderate nutritional health was found in 78(47.72%) patients and high nutritional risk was found in 15(9.09%) patients**.** The mean value of total score of the patients was 3.04±1.53 with minimum and maximum total score values of 1 & 8 respectively.

The study results showed that good nutritional health was present in 72 cases in which 31 had age ≤55 years and 41 had age >45 years, moderate nutritional health was noted in 78 cases in which 33 had age ≤55 years and 45 had age >45 years, similarly high nutritional risk was noted in 15 cases in which 7 had age ≤55 years and 8 had age >45 years. Statistically insignificant difference was found between the nutritional statuses with age categories i.e., p-value=0.952 (Table 2)

Good nutritional health was noted in 72 cases in which 49 were male and 23 were females, Moderate nutritional health was noted in 78 cases in which 57 were males and 21 were females, and High nutritional risk was noted in 15 cases in which 6 were male and 9 were females. Statistically significant difference was found between the nutritional statuses with gender i.e. p-value=0.043 (Table 3).

The study results showed that the good nutritional health was noted in 72 cases in which 43 were with normal BMI and 29 were from overweight and obese BMI, moderate nutritional health was noted in 78 cases in which 47 were from normal BMI and 31 were from overweight and obese BMI, similarly high nutritional risk was noted in 15 cases in which 7 were from normal BMI and 8 were from overweight and obese BMI. Statistically insignificant

difference was found between the nutritional statuses with BMI i.e., p-value=0.605 (Table 4).

Table 1: Frequency distribution of nutritional health checklist

Question		Frequency	%age
nable to chew hard food items with dentures	Yes	75	45.5
	No	90	54,5
Difficult for me to bite and chew meat products	Yes	76	46.1
	No	89	53.9
Less than 2 meals a day because eating with dentures is tiresome for me	Yes	50	30.3
	No	115	69.7
Unable to eat fruits with dentures	Yes	33	20.0
	No	132	80.0
Unable to eat raw vegetables with dentures	Yes	76	46.1
	No	89	53.9
Develop denture sore mouth which makes eating difficult for me	Yes	24	14.5
	No	141	85.5
Eat less because eating with loose dentures is difficult for me	Yes	28	17.0
	No	137	83.0
Appetite decreased because taste perception has altered after denture wearing	Yes	65	39.4
	No	100	60.6
Food particles get collected under dentures which makes eating difficult	Yes	52	31.5
	No	113	68.5
Tongue/cheek biting on eating with dentures which has made me eat less	Yes	22	13.3
	No	143	86.7

Table 2: Comparison of nutritional status with age

Nutritional status	Age (years)		Total
	≤55	>55	
Good nutritional health	31	41	72
Moderate nutritional health	33	45	78
High nutritional risk	7	8	15
Total	71	94	165

Chi value=0.098 p-value= 0.952 (Not significant)

Table 3: Comparison of nutritional status with gender

Nutritional status	BMI Categories		Total
	Normal	Overweight or obese	
Good nutritional health	43	29	72
Moderate nutritional health	47	31	78
High nutritional risk	7	8	15
Total	97	68	165

Chi value=1.005 p-value=0.605 (Not Significant)

Table 4: Comparison of nutritional status with BMI categories

Nutritional status	Gender		Total
	Male	Female	
Good Nutritional Health	49	23	72
Moderate Nutritional Health	57	21	78
High Nutritional risk	6	9	15
Total	112	53	165

Chi value=6.315 p-value=0.043 (Significant)

DISCUSSION

Complete tooth loss in the geriatric patients predisposes them to malnutrition and various other systemic disorders[1- 3, 5, 7], therefore, it is of vital importance to rehabilitate these patients with complete dentures. Complete dentures have been used for over a millennium for oral rehabilitation of edentulous patients[1, 16]. In our study comprising of 165 patients, good nutritional health was observed in 72(43.64%) patients, moderate nutritional health was found in 78(47.72%) patients and high nutritional risk was found in 15(9.09%) patients one month after the placement of complete dentures. Statistically insignificant difference was found between the nutritional status with age and BMI while significant relation was noted between the nutritional status and gender.

A study by Sonawane Madhuri et al[23] described in their study that the intervention with complete dentures was effective in increasing the chewing ability, body weight, food-intake, and oral health related quality of life of edentulous patients.

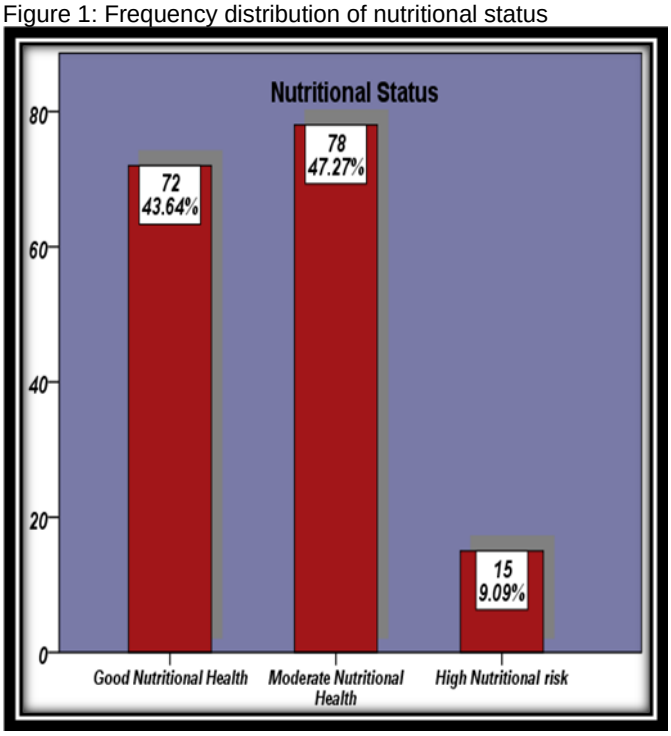
Kamal Shigli and colleagues conducted a study to find qualitative diet of complete denture patient before and one month after complete denture. One month after complete denture therapy 16(59.3%) patients showed good nutritional health, 9(33.3%) patients showed moderate nutritional health and 2(7.4%) patients showed high nutritional risk[22]. The sample size they studied was very small and the results that they produced were not convincing. Our study has a reasonable size of subjects and the results quite clearly indicate that upto 90% patients using complete dentures are either in good or moderate nutritional health. Only around 9% were in high nutritional risk. Complete dentures, therefore, restore the dentition and nutrition of a vast majority of patients satisfactorily.

Shinkai et al[24] presented that the quality of complete dentures, food grinding capacity and perception of masticatory ability were not related to the quality of the diet. The majority of persons had deficient diets, irrespective of the quality of their dentures. Koshino H et al showed in his study that insertion of denture enhances the degree of eating satisfaction which in turn contributes to psychological health and improves the Quality of Life[25].The study conducted by Paturu et al showed no significant difference in BMI among first time denture wearer patients after a period of 2 months, however they showed significant change in BMI over 12 months[26]. Paturu et al also described that there was a significant change in anthropometry and iron intake and the clinical examination showed positive changes in the patient's normal appearance, eyes and nails. This study emphasizes that every complete denture wearer needs to be periodically counseled by a registered dietician and dentist for checkup to avoid malnutrition and disease[26].

CONCLUSION

It can be concluded from the present study that a large majority of edentulous patients who were provided with conventional complete dentures for the first time were displayed good and moderate nutritional health, one month after the placement of complete dentures. However statistically insignificant difference was found between the nutritional status with age and BMI while significant relation was noted between the nutritional status and gender.

Figure 1: Frequency distribution of nutritional status



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