

Body weight changes after complete denture in edentulous patients: A hospital based study

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Abstract: This hospital based study was conducted to determine the amount of weight gain amongst edentulous patients undergoing complete denture treatment. Height and weight of edentulous patients who gave written informed consent were measured and Body Mass Index calculated at the time of denture treatment followed by 1 month and 3 month intervals. Out of the total participants (n=53), 48 (90.66%) of the participants were more than 50 years of age. In this study although the weight gain after treatment was statistically insignificant a weight loss of 1-2 kgs was recorded in only 3 participants and only in those who complained of difficulty in mastication after treatment. Mean weight of participants after 3 months of complete denture treatment was 54.55 kgs with a SD of 10.28 kgs while mean BMI of the participants at that time was 22.92 with a SD of 3.84. The difference in the mean weight and BMI at the time of treatment and 3 months after treatment was statistically insignificant (p= 0.952 and p= 1.086 respectively). 43 (87.13%) participants gave positive feedback after denture treatment.

Keywords – Weight Changes, Complete Denture, Dental Caries

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I. Introduction

Dental caries is an important public health problem. Underweight people have more severe dental caries than other individuals. Dental caries affect development and growth of children¹ and poor oral health is also an important contributing factor in involuntary weight loss amongst geriatric population.² The prevalence of edentulous patients is high worldwide³ even in developed countries.⁴ Avoidance of further toothlessness is of particular importance amongst partially dentate adults in home planning oral health care is a major public health challenge.⁵ Older people with partial or complete tooth loss change their diet and this makes them prone to deficiency of specific nutrients and generalized malnutrition. A complete prosthetic denture was associated with better nutritional status in such cases.⁶ Elderly individuals with extensive toothlessness consume soft foods which have low nutrient density.⁷ Maintenance of teeth plays a crucial role in increasing the chances of having adequate body fat percentage.⁸ Percentage of edentulous patients was high amongst rural people than urban and amongst vegetarians than non vegetarians.⁹ Partially or complete edentulous patients can be rehabilitated by the placement of removable dental prosthesis or implant supported removable dental prosthesis or partial implant fixed dental prosthesis.¹⁰

II. Objectives

The objective of this study was to determine the amount of weight gain amongst edentulous patients undergoing complete denture treatment in the hospital.

III. Methodology

This hospital based study was conducted in a tertiary hospital situated in a satellite township near a metropolitan city in Maharashtra state in western India. After obtaining permissions from the institutional authorities and the ethics committee, demographic details of edentulous patients who gave written informed consent to participate in the study were noted. Height was measured in metres using a standard measuring tape hoisted on a vertical wall with the subject standing in erect position with his feet and head touching the wall without wearing any footwear or headwear. Weight was measured in kilograms using a pre calibrated weighing machine with the subject wearing minimal clothing. Body mass index (BMI) was calculated by dividing the body weight (in kilograms (kg)) by the square of the height (in metres).

The participants were when subjected to complete denture treatment and weight of the participants was noted after a time gap of one month and three months respectively.

The obtained data were tabulated and statistically analysed using EpiInfo Version 7.0 (public domain software package from the Centers for Disease Control and Prevention, Atlanta, GA, USA). Continuous data were presented as Mean and Standard Deviation (SD). 95% confidence interval (CI) was expressed in the range of (Mean – [1.96 x Standard Error]) to (Mean + [1.96 x Standard Error]). Categorical data were presented as percentage distribution. Statistical significance of difference (taken as p-value<0.05) was calculated using standard error of difference between 2 means and Karl Pearson’s Chi-square test, with Mantel-Haenszel correction where applicable.

IV. Results

4.1. Demographic details:

Out of the total participants (n=53), 26 (49.06%) were females while 27 (50.94%) participants were males. 32 (60.4%) participants were from the local municipal corporation area while 21 (39.6%) participants were from neighbouring municipal corporation areas. Mean age of participants was 63.13 years with a SD of 8.68 years.

Table 1: Demographic profile (n=53)

		Female	Male
Religion	Christian	0 (0)	1 (1.9)
	Hindu	25 (47.17)	24 (45.28)
	Muslim	1 (1.89)	2 (3.77)
Age	<=50 yrs	2 (3.77)	3 (5.66)
	51-65 yrs	16 (30.19)	13 (24.53)
	>65 yrs	8 (15.09)	11 (20.75)
Address	Neighbouring Corporations	12 (22.6)	9 (17)
	Local Corporation	14 (26.4)	18 (34)

Figures in parentheses indicate percentages

4.2 Anthropometry:

Mean height of the participants was 154.13 cms with a standard deviation of 7.68 cms. Mean weight of the participants was 52.7 kgs with a SD of 9.71 kgs. Mean BMI of the participants was 22.14 with a SD of 3.57.

Mean weight of participants after 1 month of complete denture treatment was 53.98 kgs with a SD of 9.94 kgs while mean BMI at that time was 22.68 with a SD of 3.68. The difference in the mean weight and BMI at the time of treatment and 1 month after treatment was statistically insignificant p= 0.672 and p= 0.77 respectively.

Mean weight of participants after 3 months of complete denture treatment was 54.55 kgs with a SD of 10.28 kgs while mean BMI of the participants at that time was 22.92 with a SD of 3.84. The difference in the mean weight and BMI at the time of treatment and 3 months after treatment was statistically insignificant (p= 0.952 and p= 1.086 respectively).

Table 2: Anthropometry (n=53)

			Female	Male
Pre-Treatment	Weight	<=50 kg	17 (32.08)	6 (11.32)
		51-60 kg	7 (13.21)	10 (18.87)
		>60 kg	2 (3.77)	11 (20.75)
	BMI	<=15	9 (16.98)	6 (11.32)
		15.01-20	13 (24.53)	17 (32.08)
		20.01-25	4 (7.55)	3 (5.66)
	>25	0 (0.00)	1 (1.89)	
1 month Post-treatment	Weight	<=50 kg	16 (30.19)	5 (9.43)
		51-60 kg	8 (15.09)	11 (20.75)
		>60 kg	2 (3.77)	11 (20.75)
	BMI	<=15	9 (16.98)	6 (11.32)
		15.01-20	12 (22.64)	15 (28.3)
		20.01-25	3 (5.66)	5 (9.43)
	>25	2 (3.7)	1 (1.89)	
3 months Post-treatment	Weight	<=50 kg	16 (30.19)	5 (9.43)
		51-60 kg	7 (13.21)	10 (18.87)
		>60 kg	3 (5.66)	12 (22.64)
	BMI	<=15	8 (15.09)	6 (11.32)
		15.01-20	12 (22.64)	14 (26.42)
		20.01-25	4 (7.55)	6 (11.32)

	>25	2 (3.77)	1 (1.89)
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Figures in parentheses indicate percentages

4.3 Comments after denture treatment:

23 (43.39%) of the participants said that they were satisfied with the treatment. 9(16.98%) of the participants commented that their mastication had improved while 11 (20.76%) commented that their teeth had aesthetically improved. Only 10 (18.87%) of the participants complaint of difficulty in mastication.

Table 3: Post treatment comments

	Female	Male
Aesthetically improved	4 (7.55)	7 (13.21)
Difficulty in mastication	4 (7.55)	6 (11.32)
Improved mastication	7 (13.21)	2 (3.77)
Satisfactory	11 (20.75)	12 (22.64)

Figures in parentheses indicate percentages

V. Discussion

5.1. Demographic details: In this study, 48 (90.66%) of the participants were more than 50 years of age. In an American study the average age of edentulous patients was 77 years.² In another Chinese study most of the participants were children less than 8 years of age with severe dental caries.¹ This could be due to the fact that the problems of dental loss due to caries and other infections is widely spread in the developed and developing world and across all age groups.

5.2. Anthropometry: In this study although the weight gain after treatment was statistically insignificant a weight loss of 1-2 kgs was recorded in only 3 participants and only in those who complained of difficulty in mastication after treatment. In an American study edentulism was the primary cause of nutritional problems.⁴ In a Brazilian study edentulism forced participants to change their dietary pattern causing lack of specific nutrients.⁶ In another Indian study, elderly individuals with extensive loss resorted to specific soft diet which made them vulnerable to lack of nutrients and that these patients need counseling by a registered dietitian and the dentist to avoid malnutrition.⁷ In another Brazilian study edentulous patients not properly rehabilitated with dentures showed unfavourable body mass.¹¹ Comprehensive dental rehabilitation resulted in catch-up growth in children with nursing caries.¹² In yet another study denture did not influence weight amongst institutionalized patients.¹³

5.3. Comments after denture treatment: 43 (87.13%) participants gave positive feedback after denture treatment. In a study by Goncalves et. al., the effect of different types of dentures on masticatory aspects was unclear in a clinical trial.¹⁰ In another Japanese study analysis showed that being underweight was significantly associated with lower masticatory performance.¹⁴ In another community based study participants complained of looseness of dentures which could be due to weight loss.¹⁵

VI. Conclusion

Most of the participants were more than 50 years of age and most of them gave positive comments or feedback after denture treatment. The difference in the mean weight and BMI at the time of treatment and 3 months after treatment was statistically insignificant ($p = 0.952$ and $p = 1.086$ respectively). Almost all the participants have improved weights after dental treatment. A regular follow up and proper treatment prevents significant weight loss and malnutrition in the elderly population and helps maintain weight thus preventing many weight related problems and its complications.

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