An Evaluation of Factors Affecting Patient's Decision Making Regarding Dental Prosthetic Treatment

Nayana Paul[1], Dhakshaini M. R.[2], Raghavendra Swamy K. N.[3], Sowmya S[4], Ravi M. B.[5]

[1]Department of Prosthodontics and Crown & Bridge, J.S.S. Dental College & Hospital, a Constituent College of JSS Academy of Higher Education and Research, Mysuru, Karnataka, India. [2]Department of Prosthodontics and Crown & Bridge, J.S.S. Dental College & Hospital, a Constituent College of JSS Academy of Higher Education and Research, Mysuru, Karnataka, India. [3]Department of Prosthodontics and Crown & Bridge, J.S.S. Dental College & Hospital, a Constituent College of JSS Academy of Higher Education and Research, Mysuru, Karnataka, India. [4]Department of Prosthodontics and Crown & Bridge JSS Dental College and Hospital, a Constituent College of JSS Academy of Higher Education and Research, Mysuru, Karnataka, India. [5]Department of Prosthodontics and Crown & Bridge JSS Dental College and Hospital, a Constituent College of JSS Academy of Higher Education and Research, Mysuru, Karnataka, India.

ABSTRACT

BACKGROUND
For fabricating dental prostheses that meet patients' demands and have good longevity and function, appropriate treatment planning and decision-making are required. Therefore, not only technical skills and clinical judgment of the dentist are needed, but also patients' attitude toward treatment plays a critical role in post-treatment satisfaction. The aim of this study was to investigate empirically the factors affecting the patients' decision-making and to contribute to improvement of public oral health.

METHODS
A cross-sectional survey was conducted to determine patients' attitudes towards dental prosthetic treatment. Part A of the questionnaire consisted of demographic information of participants enrolled for the study. Part B of the questionnaire comprised of close ended multiple-choice questions stating the reasons cited by them if they decline the proposed treatment plan. Data was subjected to frequency analysis, cross-tabulation analysis and logistic regression analysis to determine how each independent variable is affecting patient's decision making.

RESULTS
Among 60 participants, 16 (27 %) accepted and 44 (73 %) rejected the proposed treatment plan. About 43.2% of the participants cited high expenditure as the reason for not accepting the given treatment option. Cross tabulation analysis showed better acceptance in elderly group (p= 0.049). Logistic regression analysis was also applied to evaluate the influence of age on the decision-making process which showed that aging increased the logarithm multiplication.

CONCLUSIONS
In the sample of population studied, most of the patients declined the proposed treatment plan and accepted the alternate one. High expenditure was the most common reason for this rejection. Among all the independent variables, aging increased the logarithm multiplication and had a positive relation with the decision-making process.

KEY WORDS
Decision-Making, Patient's Attitudes, Prosthetic Treatment, Treatment Plan

BACKGROUND

With the increase in dental health awareness in population, the demand for prosthodontic rehabilitation has increased in partially or completely edentulous patients. The definitive prosthetic treatment can improve oral function, aesthetics and quality of life of most patients. Despite the great decline in dental caries and tooth loss in the last decades, it is believed that there will be an increased demand for prosthodontic care in the future.[1] Decision-making has been defined as "a structured approach to guide a person or group to workable solutions of a problem, to make plans and to evaluate data.[2] John Dewey [3] in 1916 described the sequence of events in problem solving as: (a) Presentation of the problem (b) Definition of the problem (c) Formulation of the hypothesis. And (d) Verification of the hypothesis.

Traditionally, determination of prosthodontic treatment options and selection of treatment have been considered part of the practitioner's professional responsibility. Now prosthetic treatment is based on shared decision-making process and includes multidimensional aspects of patient perceived needs, desires and expectations [4]. Professionals should change from making unilateral decisions and consider the patients' point of view before any treatment decision is made.[5,6,7]

Decision making in dental prosthetic treatment can be divided into- 1. Normative approach which is guided by the clinical health state assessed or physical impairment. 2. Sociodental approach is multidimensional and involves a strategic mediation of several aspects of patient's perceived need and potential risks and benefits of intervention.[8]

Problem-Solving Decision-Making (PSDM) Scale the four PS Tasks are-[9]
- Who should determine (Diagnose) what the likely causes of your symptoms are?
- Who should determine what the treatment options are? Who should determine what the risks and benefits for each treatment option are?
- Who should determine how likely each of these risks and benefits are to happen?

The Two DM Tasks are-
- Given the risks and benefits of these possible treatments, who should decide how acceptable those risks and benefits are for you?
- Given all the information about risks and benefits of the possible treatments, who should decide what treatment option should be selected?
- All six tasks are evaluated on a 5-point Likert scale, where: 1 ¼ the doctor alone; 2 ¼ mostly the doctor; 3 ¼ both equally; 4 ¼ mostly me and 5 ¼ me alone.

Box 1. Problem-Solving Decision-Making (PSDM) Scale

In order to understand the role of patients in decision making process a scale has been designed called Problem-Solving Decision Making (PSDM) scale (Box 1) by Deber et al[9] in 1996. A validated questionnaire can be a prospective tool to determine patient's satisfaction towards the proposed treatment.[10] Decision to get dental prosthetic treatment is expected to have a close relationship with demographic characteristics such as gender, age, education, economic condition, interest and expectation about health, and surrounding environment.[11] Hence investigating the status of dental prosthetic treatment and factors affecting decision making of dental prosthetic treatment are meaningful not only to the patients but to restoring dentist as well. Previously various studies have assessed the role of clinicians in the decision-making process but very few investigators have assessed the attitude of patients toward replacement of teeth. In addition, results from such studies cannot be generalized as population sample varies according to geographical location. Therefore, the purpose of the present study was to assess decisions toward replacement of teeth among patients who reported to our institute, JSS Dental College and Hospital, Mysore, Karnataka, India.

METHODS

All the patients reporting to the Department of Prosthodontics, Crown and Bridge, JSS Dental College and Hospital, Mysuru from 1st February 2019 to 7th February 2019 were surveyed. A convenient sample of 60 participants were taken based on the inclusion criteria. Informed consent was obtained for all the participants. The study protocol was approved by the Ethical Committee of JSS University. The age of participants ranged from 20-75 years. Participants with hearing impairments, physical disabilities, neuromuscular disorders and those who need an urgent treatment were excluded from the study. This survey was performed with two sets of questionnaires. Part A consisted of demographic information such as name, age, gender, educational status, marital status, and monthly income of the patients, followed by clinical examination, which was recorded by one calibrated investigator to avoid operator bias. Part B of the questionnaire comprised of close ended multiple-choice questions to be filled by the patient himself/herself. It was prepared in English as well as in the regional language, Kannada to facilitate data processing and avoid ambiguity. The choices were a set of 13 most commonly cited reasons by the patients for not accepting the proposed treatment plan or opting for an alternate treatment plan.

Participants were divided into various categories based on the demographic data collected and cross tabulation analysis and logistic regression analysis were done to evaluate the relation between independent variables and decision to get dental prosthetic treatment. The independent variables evaluated were age, gender, marital status, education, occupation, income, past dental treatment, past dental experience and expectation about dental prosthetic treatment. The data were statistically analysed using SPSS program and frequency analysis, cross tabulation analysis, and logistic regression analysis were introduced.

The null hypothesis stated that the decision to get dental prosthetic treatment will not be influenced by the general characteristics of the participants, past dental experience and patient's expectation.

Statistical Analysis

Collected data were statistically analysed using chi-square test at a significance level of p<.05. For cross tabulation analysis Cramer's V test has been used (p<.05). For logistic regression analysis, Hosmer and Lemeshow test (p<.05).

RESULTS

The general characteristics of participants are shown in Table 1. Among 60 participants, 16 (27%) accepted the proposed treatment plan and 44 (73%) rejected the proposed

treatment plan (fig. 1). The reasons cited by the participants for not accepting the proposed treatment plan has been described in Table 2. The most common reason cited by the participants for not accepting the treatment plan was high expenditure (43.2%) followed by unwillingness to undergo the required pre-prosthetic treatment (20.5%).

Characteristics	Category	Number (n)	(%)
Age	Young adults (18-35)	16	26.7
	Middle Aged (36-59)	31	51.7
	Elderly (60 and above)	13	21.7
Gender	Male	30	50
	Female	30	50
Marital status	Unmarried	13	21.7
	Married	44	73.3
	Widow	3	5
Education	Primary School	4	6.7
	Secondary School	8	13.3
	High School	11	18.3
	Graduate	34	56.7
	Postgraduate	3	5
Occupation	Professional	3	5
	Office Workers	8	13.3
	Businessman	4	6.7
	Housewives	21	35.0
	Farmer	9	15.0
	Students	10	16.7
	Others	5	8.3
Monthly Income	<10,000	0	0
	10,000-30,000	48	80.0
	31,000-50,000	10	16.7
	>50,000	2	3.3
Past dental treatment	Yes	33	55.0
	No	27	45.0
Past dental experience	Bad	6	10.0
	Satisfactory	17	28.3
	Good	10	16.7
	No Experience	27	45.0
Expectation	Less	3	5.0
	Moderate	43	71.7
	High	14	23.3
Acceptance of treatment plan	Accepted	16	26.7
	Not Accepted	44	73.3

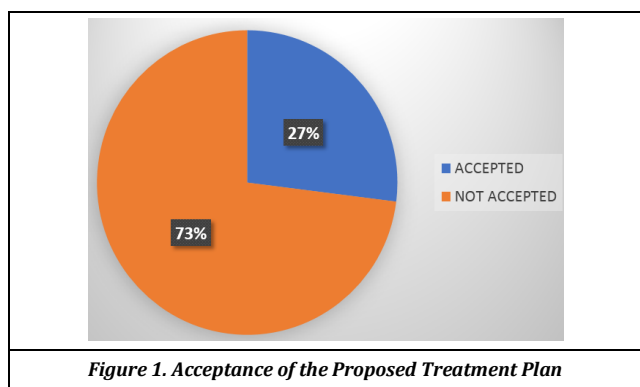*Table 1. General Characteristics of Respondents N= 60*

Figure 1. Acceptance of the Proposed Treatment Plan

Reasons for not Accepting the Treatment Plan	No. of Respondents =44	%
Not convinced about the treatment plan	1	2.3
Expensive Treatment	19	43.2
Dependent on someone for travel/money	6	13.6
Do not feel fit to come for the required number of appointments	3	6.8
Do not feel the need for the treatment	2	4.5
Do not want to undergo the pre-prosthetic treatment	9	20.5
Need urgent treatment	4	9.1
Total	**44**	**100.0**

Table 2. Reasons for Not Accepting the Proposed Treatment Plan

Age	Accepted N (%)	Not Accepted N (%)	Total
18-35	1(6.2%)	15 (93.8%)	16 (100%)
36-59	9 (29.0%)	22 (71.0%)	31(100%)
60 and above	6 (46.2%)	53.8 (53.8%)	13 (100%)
Total	16 (26.7%)	44 (73.3%)	60 (100%)

Table 3. Cross Tabulation Analysis between Age and Decision Making

Test used: Cramer's V p=.049

Age	Expect			Total
	Less	Moderate	High	
18-35	0	15	1	16
	0.0%	34.9%	7.1%	26.7%
36-59	1	19	11	31
	33.3%	44.2%	78.6%	51.7%
60 and above	2	9	2	13
	66.7%	20.9%	14.3%	21.7%
Total	3	43	14	60
	100.0%	100.0%	100.0%	100.0%

Table 4. Cross Tabulation Analysis between Age and Expectation

Test used: Cramer's V p=.046

Education	Expectation			Total
	Less	Moderate	High	
Primary School	2	1	1	4
	66.7%	2.3%	7.1%	6.7%
Sec school	1	2	5	8
	33.3%	4.7%	35.7%	13.3%
High school	0	10	1	11
	0.0%	23.3%	7.1%	18.3%
Graduation	0	28	6	34
	0.0%	65.1%	42.9%	56.7%
Post-graduation	0	2	1	3
	0.0%	4.7%	7.1%	5.0%
Total	3	43	14	60
	100.0%	100.0%	100.0%	100.0%

Table 5. Cross Tabulation Analysis between Education and Expectation

Test used: Cramer's V p=.001

Characteristics	B	S.E.	Wald	df	Sig.	Exp (B)
Age	-2.140	.878	5.944	1	.015	.118
Gender	-1.370	.999	1.882	1	.170	.254
Marital status	.341	1.186	.082	1	.774	1.406
Education	-.949	.540	3.094	1	.079	.387
Occupation	.145	.250	.337	1	.562	1.156
Income	-1.349	.826	2.670	1	.102	.259
Past dental treatment	2.726	1.680	2.633	1	.105	15.278
Past dental Experience	-.976	.788	1.534	1	.216	.377
Expectation	.858	.994	.746	1	.388	2.359
Constant	9.856	4.726	4.350	1	.037	19065.513

Table 6. Logistic Regression Analysis of Factors Affecting Decision-Making of Dental Prosthetic Treatment

Cross tabulation analysis between age and patient's acceptance (Table 3) shows better acceptance rate in elderly population (p=.049). The p value was insignificant for other independent variables. Cross tabulation analysis between age and expectation shows that elderly group has less expectation compared to the middle-aged group (p<.046, Table 4). Association table between education and expectation shows statistical significance (p=.000, Table 5). It reveals more expectation in the higher education group. Logistic regression analysis was also applied to test the hypothesis (Table 6), the influence of age on the decision-making of the prosthetic treatment showed that aging increased the logarithmic multiplication. In other words, 1-year older people had 0.118 times more decision-making of prosthetic treatment. In contrary to the results of cross tabulation analysis, logistic regression analysis showed that there is no relationship between past dental experience and acceptance rate of patient.

DISCUSSION

The null hypothesis was rejected as the logistic regression analysis showed a positive correlation between age and acceptance rate. The doctor–patient relationship has evolved since the times of paternalistic medicine and with it so has the definition of what it means to be an autonomous decision maker. Patients have seen their role broaden from one of passive recipient of care to being involved partner in the decision-making process. In most cases of actual prosthodontic treatment, it is necessary to respond to a wide variety of patient complaints, socioeconomic backgrounds, and dental statuses. In other words, prosthodontic patients generally cannot be effectively treated using a series of simple clinical steps. Making a decision regarding a treatment modality requires a great deal of time for patients with long and complex histories behind their present illnesses. Therefore, adding patient-specific variations to a baseline standardized treatment pattern (i.e., the clinical pathway) would be considered an efficient method.

However, evaluation of the patients' decisions regarding the choice of treatment before beginning of treatment is less reported in the literature.[13] This study evaluates whether patients accept the best suitable treatment plan given to them or opt for an alternative one and the reasons for the choice. Various factors can influence the decision making of patients including age, cost, time, and fear of treatment. It will influence various government health‑care policies that have to be strategized depending on the health‑care needs of the general population. Various measures can be taken to improve standard of care, especially in rural population based on the attitude toward replacement of teeth among patients and various factors influencing their decision‑making regarding treatment options and patient compliance with the acceptance of prostheses can also be enhanced.[12]

The results of our study demonstrate the population of men and female visiting the department were equal which indicates that now both the genders are equally concerned towards their prosthetic needs. The age and other independent variables have been categorized into various groups for better understanding (Table 1).

Most of the patients visiting the department declined the proposed treatment plan (82%) and opted for an alternate one as seen in Figure 1. The most common reason cited was high expenditure (43.2 %) which is similar to the findings of other studies.[12] The reasons given by them for doing so are enumerated in Table 2. Most of the patients who rejected the proposed treatment plan were advised implant supported fixed prosthesis, but they opted for a removable one, which is a cheaper alternative. This stresses out the need that insurance should find a place in dentistry so that such treatments can be affordable to middle- and lower-income group.

Nearly, 46.2% of the elderly population accepted the proposed treatment plan as opposed to 6.2% of the younger group which shows more need of prosthetic treatment in the elderly. Hence the elderly group should be treated with more

care and research should be aimed at designing newer prosthesis/materials as per patients' needs and demand.

Almost 60% of the patients having good past dental experience accepted the treatment plan which shows that patients with good past dental experience has better acceptance and only 16.7% of the population having a bad past dental experience accepted prosthetic treatment. This employs the need to create basic awareness and confidence‑building in such patients from the diagnostic appointment itself.

A correlation between age and expectation demonstrates almost 66.7% of the elderly group has less expectation. Dental education camps, use of print media such as newspapers, advertisements, banners, posters, and visual media such as short films and videos can be done for the same for creating mass awareness of the treatment procedures and their benefits.

A positive correlation has also been obtained between education of the patient and expectation with higher education group showing more expectation. This reflects more awareness in the educated group regarding prosthetic treatment and at the same time it also stresses the need to explain the patient about the limitations of prosthetic treatment and that unrealistic expectations could not be meet.

If treatment is deemed necessary, the patient must determine whether the benefits of treatment justify the costs. The duty of the prosthodontist is to supply the patient with enough information to arrive at an informed decision about the most appropriate treatment.[13] If the patient chooses a treatment that the prosthodontist believes is not suitable for that patient, the prosthodontist can decline to treat the patient.

CONCLUSIONS

Most of the patients declined the proposed treatment plan and accepted the alternate one. High expenditure is the most common reason for this rejection. Factors affecting decision-making of dental prosthetic treatment were verified using logistic regression analysis. Aging increased the logarithmic multiplication. It is necessary to provide oral health education for the elderly group as they demand more prosthetic treatment. Second, it is very important to inform the importance of prosthetic treatment and oral health for people. Third, for those who need prosthetic treatment but cannot afford the treatment, government intervention, such as enacting an oral health initiative for alienated group's prosthetic treatments is necessary. Fourth, it is the responsibility of dental professionals and people related to dental field to inform the public about the importance of prosthetic treatment. As life expectancy increases, the population of older group increases and so do the demands and needs for prosthetic treatment. Therefore, dentists and dental technicians should make efforts to contribute to the maintenance of oral health with enthusiasm and make more people lead a healthy life by receiving prosthetic treatment in a timely manner.

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Limitations
Limited sample size and institutional setup where prosthetic treatment charges are less as compared to private dental care centres.

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