

Influencing Satisfaction for Dental Services

By Pradeep Gopalakrishna and Venkatapparao Mummalaneni

Practicing the marketing concept entails the pursuit of customer satisfaction as the chief goal of any organization. Even though satisfying customer needs can legitimately be an end in itself for some organizations, in others it is considered a means to such ends as competitive advantage, customer loyalty, long-term growth, and even survival. The need to measure customer satisfaction is a corollary to effectively implementing the marketing concept; consequently, studies tracking satisfaction are now conducted by an increasing number of organizations (Fish et al. 1990).

The 15,000 plus articles published on customer satisfaction are indicative of the growing interest in the topic shared by both practitioners and academics (Peterson and Wilson 1992). Measurement of consumer satisfaction with health care has "paralleled the growth of the consumer movement in general," as evidenced by the huge increase in the number of studies since 1970 (Aday, Anderson, and Fleming 1980). Marketing scholars have, in fact, referred to this introduction of marketing culture into the health care industry as the "marketingization" of the field (Singh 1990).

As part of this movement to a marketing culture in the health care sector, dental care services also emphasize consumer satisfaction. Our review of the previous research regarding important marketing factors influencing dental satisfaction/dissatisfaction identified four major sources: technical competence of the dentist, personality of the dentist, office organization, and financial considerations (Koslowsky, Bailit, and Valluzo 1974).

Further, although demographic factors such as age and gender have been frequently employed in research concerning

A strong concern about consumer satisfaction characterizes the health care industry, reflecting, perhaps, the introduction of the marketing culture into this service industry. Consequently, consumer satisfaction with dental services has become the focus of several studies published in recent years. Past research has focused on two major issues: the initial choice of a dentist and continuity in dentist-patient relationships. The authors propose that consumer satisfaction with dental care is influenced by the variables waiting time, availability/convenience of care, pain management by dentists, costs, and continuity of care. They also hypothesize that demographic characteristics such as gender and age also influence consumer satisfaction. Implications for the management of dental practice are discussed. An abstract of this article was published in the 1992 AAAHCR Conference Proceedings.

patient satisfaction with general health care, these variables, to our knowledge, have not been examined in the context of dental care. Our study empirically examines the impact of both patient sociodemographic factors (age, sex) and five managerially controllable dimensions of dental practice (dentist's management of pain, waiting time, availability/convenience of care, cost of care, and continuity of care) on consumer satisfaction with dental care.

Background

Two streams of literature have been building in the field of dentist-patient behaviors. First, numerous articles have been written regarding factors patients consider prior to choosing a dentist for the first time (Hill, Garner, and Hanna 1990; Barnes and Mowatt 1986; Kress and Silversin 1983). The second stream pertains

to those factors which keep patients with their dentists for extended periods of time prior to switching to different dentists (Koslowsky, Bailit, and Valluzo 1974). Relevant studies from both of these streams are summarized here to provide the basis for the hypotheses to be tested later.

Technical competence of the dentist is a key determinant of dental satisfaction (Garfunkel 1980; Koslowsky, Bailit, and Valluzo 1974). While most previous studies suggest that a majority of respondents rank a dentist's professional competence near the top of contributory factors, some contradictory evidence is available as well. For example, Kressel and Haycock (1988), in their study of patients switching behavior, suggested that technical competence of the dentist was cited by a meager 3% of the sample.

Barnes and Mowatt (1986) reported that 93% of the patients

consider the dentist's willingness to talk about the treatment to be a critical factor in any evaluation of the care received. According to Jenny et. al. (1973), 33% of the respondents identified interpersonal characteristics and good patient relationships to be key determinants of satisfaction.

The importance of the dentist's personality as a major factor affecting dental satisfaction also has been suggested during the initial selection of a dentist (McKeithen 1966). Personality characteristics of the dentist have been linked to low attendance rates of patients at dentist offices as well. Barnes and Mowatt (1986) found the dentist's willingness to talk to patients and sensitivity expressed toward children as important criteria in the assessment of dental care. Therefore, personality in general as well as specific personality traits are relatively important considerations in the evaluation of a dentist and dental services.

Relative to variables reported above, office organization has been cited by Koslowsky, Bailit, and Valluzo (1974) to be a somewhat less important determinant of satisfaction. However, while examining the influence of office organization on dental service satisfaction, Andrus (1986) offered somewhat contradictory evidence about its influence on satisfaction with dental care. Andrus and Buchheister's (1985) findings corroborate those results, indicating that office organization dimensions such as the atmosphere of the waiting room—neatness, comfort of seating, magazine selection, and music—does have a significant influence on satisfaction.

Time and again, dental costs have been reported by patients as determinants of satisfaction. Although price may not be a critical factor in the initial choice of a dentist, patients subsequently become "cost conscious" and rather disillusioned with the high costs of dental care (Garry 1972). Hill, Carner, and Hanna (1990) concluded that, even though consumers are aware of skyrocketing dental costs and out-of-pocket expenses, price is not a critical complaint as long as services rendered are reasonably commensurate with costs.

This notion of value-received is further corroborated in an earlier study by Barnes and Mowatt (1986), who suggested that financial consideration may be a lower priority for consumers than the quality of care rendered and the personalized attention received. The reasons they offered included the nature of dental services as well as the fact that increasing numbers of patients have dental insurance coverage.

Patients' sociodemographic characteristics also influence general health care satisfaction (Dolinsky and Caputo 1990; Singh 1990). According to Fox and Storms (1981), age and sex are significant predictors of satisfaction with health care. The influence of these demographic factors, however, is not always consistent.

A recent study by Singh (1990), for example, found gender to be a weak discriminator between the "satisfied" and "dissatisfied" groups. However, even though age had no statistically significant influence in that study, Dolinsky and Caputo (1990) found the influence of age on health care satisfaction to be significant in the case of fee-for-service facilities. An extensive meta-analytical review by Hall and Dornan (1990), who examined the relationships between certain sociodemographic characteristics and satisfaction, found the influence of gender to be weak.

Age has been found to be more strongly associated with patient satisfaction and the evidence from previous research regarding this relationship is less ambiguous (Hall and Dornan 1990). Specifically, older patients express greater levels of satisfaction with health care than younger patients.

In the case of dental care satisfaction, the role of demographic factors such as age and gender is not well established. Although

we have not found studies linking demographic variables to satisfaction, the research by Aday, Anderson, and Fleming (1980) has examined their impact on dental utilization patterns. They found that sociodemographic factors, such as education and race, explain part of the variation in consumer visits to dentists. Similarly, the influence of gender has been identified in a study by Breslow cited by Luft (1980). Women, according to this study, had more dental examinations than men across a variety of health insurance plans.

Even though a large number of studies are now available on the subject of dental satisfaction, they have a few drawbacks:

- To date most of the studies have explored dimensions of dental satisfaction in one city, state, or region of the country.
- Inconsistencies abound in regard to the relative contributions of the various dimensions of dental service.
- Few empirical studies have examined the influence of reported continuity of dental care on overall consumer satisfaction.
- The contributions of demographic factors to satisfaction with dental care services have not been adequately assessed.

One objective of this article is to present a model integrating patient sociodemographic characteristics with major dimensions of dental practice that serve as sources of satisfaction. Next, we will assess simultaneously the impact of patients' sociodemographic characteristics and the relative influence of major factors—such as waiting time, availability/convenience of dental care, continuity of care, cost of care, and management of dental pain—on dental satisfaction.

Proposed Conceptual Framework

Despite the fact that numerous studies have been conducted on the topic of dental satisfaction, surprisingly few conceptual models are available showing the influence of delivery system characteristics (including cost and continuity of care) and antecedents (such as age and gender) on satisfaction. Two specific models were examined for the purposes of this study: the original conceptual scheme developed by Aday, Anderson, and Fleming (1980) to study access to health care and one by Rouse (1990), who examined dental consumption patterns by drawing upon Moschis and Churchill's (1978) socialization model as a framework. Our framework is an integration of the elements proposed in both models.

The adapted model consists of three main elements: antecedent variables (age, sex), characteristics of the delivery system, and consumer satisfaction. The relationships among these variables are depicted in Figure 1.

FIGURE 1

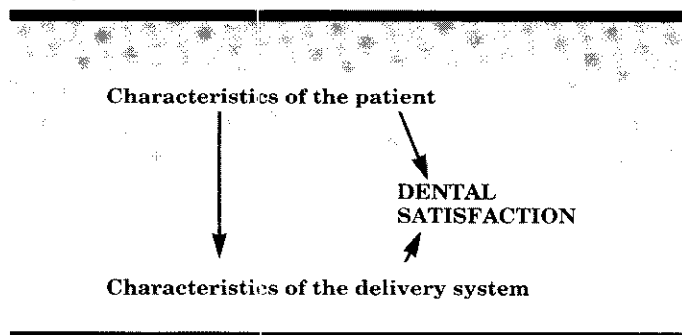


TABLE 1**Sample Demographic Profile**

Characteristic	Percentage of respondents (n=3055)
Sex	
Male	54.2
Female	45.8
Age (years)	
25 or less	34.2
26 to 30	14.4
31 to 35	13.4
36 to 40	9.2
41 to 45	7.6
46 to 50	7.2
51 to 55	6.9
56 to 60	6.3
60 or more	0.8
Education	
High school or less	71.5
College or less	23.5
Graduate school	5.0
Current employment status	
Working	54.4
Non-working	45.6
Marital status	
Single	26.3
Married	65.2
Divorced	3.7
Separated	3.0
Widowed	1.8

Hypotheses

Evidence from the research cited here, while at times inconsistent, nevertheless suggests that delivery system characteristics, such as cost and convenience of care, are significant determinants of consumer satisfaction with dental care. Therefore, it is hypothesized that:

H₁: Less waiting time, availability and convenience of dental care, continuity of care, low-cost, and effective management of pain by dentists will positively influence dental satisfaction.

H₂: Older patients will be more satisfied with dental care than younger patients.

H₃: Females are likely to be more satisfied with dental care than males.

Methodology**Sample**

Patients who participated in a major health care study undertaken by a research agency under the auspices of the U.S. Department of Health and Human Services served as the source of data. The data employed for the analysis reported

TABLE 2**Sample Items Used in the Present Study for Measurement Purposes**

Variables	Item(s) Employed
Waiting time	People are usually kept waiting a long time at the dentist's office
	It's hard to get an appointment for dental care right away
	Office hours are good for most people
Availability/convenience	Places where you can get dental are of dental care conveniently located
	There are enough dentists around here
	Reported continuity of I see the same dentist just about care everytime I go for dental care
Cost of dental care	The fees dentists charge are too high
	Dentists always avoid unnecessary patient expenses
	Management of dental pain Dentists should do more to reduce pain
Overall dental	Sometimes I avoid going to the dentist because it is painful
	I am not concerned about feeling pain when I go for dental care
Overall dental	There are things about the dental care satisfaction I receive that could be better

here represent a portion of the data derived from the large scale field study. Although this source study was truly broad in scope, part of its purpose was to assess the attitudes of patients toward dental services and to examine their levels of satisfaction with several aspects of dental care. The present data has been drawn from this portion of the study.

Adult patients drawn from five different sites constitute the sample. All participants are members of a fee-for-service facility. The subjects were selected on the basis of a sophisticated sampling plan from the population of their respective areas. However, adults over age 62 and Medicare recipients were excluded, leaving only data from adult patients between the ages 14 and 62 for analysis.

TABLE 3**Variables and Their Reliability Scores**

Composite Variable	Number of Items	Cronbach's Alpha
Waiting time	3	0.47
Availability & convenience of care	2	0.51
Cost of care	2	0.50
Pain management	3	0.60

A total of 3,436 participants representing five different sites located in the Midwest, Northeast, and Southeast regions of the U.S. were selected for the sample. From these, 3,055 usable responses were obtained representing a response rate of 89%. The usable response rate was so high because we provided several incentives to encourage the subjects' participation as part of a well-executed field study. See Table 1 for a demographic profile of the sample.

Likert scales were used to measure the different variables relating to satisfaction with dental care. All negatively worded questions were reverse coded before summing up the questions making up a specific variable. Both single- and multiple-item measures were on the study variables. While continuity of medical care and overall dental satisfaction were measured using single items, the remaining variables were measured using multiple items. Satisfaction with availability/convenience of dental care and satisfaction with cost of dental care were measured using two items. Finally, satisfaction with pain management and satisfaction with waiting time were measured using three items.

A description of all items for each of the study variables is shown in Table 2. The reliability score is a measure of the internal consistency, which is reported using Cronbach's coefficient alpha. The Cronbach's alpha values were found to be within the range of .47 and .60 for the composite variables. The reliability scores for the composite variables are reported in Table 3. According to Nunnally (1978), alpha values above .7 indicate sound and reliable measures. Refinement of measures leading to higher reliabilities could not be attempted here because secondary data are being used.

The criterion variable is the overall patient satisfaction with dental care. The predictor variables employed in our study are of two types: nominal and continuous. The only nominal variable included here is gender. The continuous variables are age (all adults between ages 14 and 62), waiting time, availability/convenience of dental care, reported continuity of dental care, cost of care, and management of dental pain.

Two data analysis techniques were used. Multiple regression analysis was employed to test the first hypothesis. The sociodemographic variables were excluded from the predictor set. Next, ANCOVA was selected to test the influence of

all the study variables on dental satisfaction. Because the predictor variable set included both interval and nominal scaled variables (Hypotheses 2 and 3), ANCOVA was considered to be the appropriate data analytic technique. The cutoff for statistical significance was set at the $\alpha = .05$ level for the overall model as well as the individual predictors in both types of analyses.

Results

Table 4 presents the zero-order correlations between the independent variables and the dependent variable. Because the r values were not greater than .5, multicollinearity (Kerlinger and Pedazhur 1973) is not a problem in our study. Furthermore, since all of the Pearson correlation coefficients between the independent variables and the dependent variable exceed the $r = .1$ cutoff level recommended by Kerlinger and Pedazhur (1973), they merit inclusion in the model.

Table 5 presents the results of the regression analysis showing that the overall model is significant and can explain over 19% of the variance in overall dental satisfaction. Furthermore, all the variables in the predictor set are highly significant at the $\alpha = .05$ level. The size of the Beta weights indicates that waiting time is the most important predictor of overall dental satisfaction, followed in order of importance by management of dental pain, cost of care, continuity of care and availability/convenience of dental care. Clearly, the less the waiting time or better the dentist's professional competence to manage pain, the higher the satisfaction with dental services. Thus, Hypothesis 1 receives strong support from the data examined here.

Next, the covariance analysis was run using the SPSSX statistical package. Table 6 provides the ANCOVA results. The amount of variance explained by the model is a modest 20.25 percentage. The model is significant at the $\alpha = .05$ level. With the only exception of age, all of the predictor variables are significant at the .05 level. Management of dental pain shows the highest F -value and, thus, emerges as the strongest contributor to overall satisfaction with dental care.

What is really interesting is that age as a predictor is not significant at the $\alpha = .05$ level. This implies that, at least among the adults between the ages 14 and 62, age does not influence consumer evaluations of dental care and satisfac-

TABLE 4
Pearson Correlation Coefficients

	Satisfaction w/dental care	Waiting time	Availability & convenience of care	Cost of care	Pain management	Continuity of care
Satisfaction with dental care	1.000	0.2975	0.2134	0.2809	.2839	.2410
Waiting time		1.0000	0.3026	0.3436	.2390	.2350
Availability & convenience of care			1.0000	0.1263	.1290	.2190
Cost of care				1.0000	.1911	.1100
Pain management					1.0000	.1750
Continuity of care						1.000

tion with it. Thus, Hypothesis 2 is not supported. However, gender has a significant influence on dental satisfaction in the direction proposed by the last hypothesis. Women tend to express higher levels of satisfaction with dental care than men, thus, confirming findings from previous research.

A comparison of the two models in Tables 5 and 6 reveals that, with the inclusion of gender and age as predictors, the power of the model as indicated by the *r*-squared values increased slightly from 19% to over 20%. Much of this improvement is attributable to the gender factor. A comparison of group means reveals that females are more satisfied with dental care than males. Furthermore, while their relative contributions change somewhat, management of pain by dentists and cost of dental care remain important predictors of overall dental satisfaction in both models. Availability and convenience of care was the least important predictor of overall dental satisfaction in both the models.

Discussion

Our study makes a few very significant contributions to the growing body of research on consumer satisfaction with dental care. First, we have tested a common set of predictors for overall dental satisfaction in fee-for-service facilities across multiple geographical locations throughout the United States. Though generalizations must always be made with caution, it may be noted that the results here represent the perceptions of a sample of consumers from across the country. Since the sample is large and represents a broad cross-section of the U.S. population, the study is an improvement over several previous studies characterized by geographic or other kinds of limitations. The second contribution is the inclusion of two rarely used variables as predictors of satisfaction with dental care: waiting time and the continuity of patient-dentist relationships.

The importance of waiting time for receiving dental care has been suggested, but its impact on consumer satisfaction has not been critically evaluated in previous research. Waiting time in combination with the other characteristics of the delivery system accounts for 19.14% of the variation in

dental satisfaction. An important finding is that waiting time enters the regression equation first in a stepwise regression and it alone accounts for nearly half (8.76%) of the explained variation in consumer satisfaction with dental services. As the baby boom generation, which is considered more demanding and assertive of its rights as consumers, approaches middle age, and as their children enter teenage years, the importance of this variable might increase.

In their study of consumer satisfaction with health care, Aday, Anderson, and Fleming (1980) made the distinction between waiting for an appointment and waiting at the doctor's office and concluded that satisfaction is more strongly influenced by the latter. Because this is a useful distinction to make from the point of view of managing the dentist's office and marketing dental care services, we compared the relative contributions of these two variables to overall satisfaction. Results from correlational analysis indicate that, as with health care in general, waiting time at the dentist's office has a stronger influence on consumer satisfaction than waiting time for the appointment (apparently in the case of routine care) itself.

Pain management by the dentist was found to be the second most important factor influencing overall satisfaction. This finding is in agreement with most of the previous studies (Jenny et al. 1973; Andrus and Buchheister 1985), which suggests that professional ability ranks among the top three factors influencing overall satisfaction. A plausible explanation for the importance of this variable to overall satisfaction with dental services is that today's consumer is more involved in the selection and evaluation of dentists. Partly, this is because of the higher education levels prevalent in our society. Also, the need to minimize painful procedures is a prerequisite to increasing repeat visits by patients. Providing information to patients about dental procedures, especially regarding pain management by the dentist, might be advantageous in the marketing of a dentist's practice.

Continuity of care, though significant, is a less important predictor of overall dental satisfaction. Kressel and Haycock (1988) found lack of a continuous relationship with one's dentist to be the primary reason for switching behavior. This result has serious marketing implications. The importance of

TABLE 5

Regression Results With Individual Parameter Results

Variables	Standardized B	T	PR > T
Intercept	.978000	0.3279	.000
Waiting time	.296506	7.2020	.000
Availability & convenience of care	.096114	5.551	.000
Continuity of care	.152264	8.067	.000
Cost of care	.172813	9.760	.000
Management of dental pain	.226300	10.766	.000
F-Value 145.591			
Probability > F .0001			
Adjusted R-squared 19.14%			

seeing the same dentist every time can be used by dentists as a marketing tactic to improve the overall image of their dental practice. Further analysis of our data indicates that in cases where continuity of care exists, it moderates the impact of negative influencers such as high cost and longer waiting times on consumer satisfaction.

The implication for dental practice then is that the dentist-patient relationship should be nourished for these as well as other potential benefits. Techniques employed in "loyalty marketing" can help increase the effectiveness of a dentist's practice. For example, several dentists currently send reminder notices for routinely scheduled services.

Finally, cost of dental care and availability and convenience of care were found to be significant but less important predictors of dental satisfaction. Financial considerations are important because, with the rising costs of dental procedures, it is customary to charge patients based on procedures performed. Given that "costs of doing business" are the most important factors influencing the fees charged by dentists (Becker and Kaldenberg 1991), it is helpful for dentists to explain to their patients the rationale behind the fees charged. Such explanations should counter the perception that dentists charge too high a fee for their services.

According to Warden (1988), managed care dental plans that emphasize preventive care offer savings of nearly 35% over traditional FFS dental insurance. It would be interesting to compare in future research the levels of satisfaction in FFS and managed care groups to see whether the levels of satisfaction are higher among the latter.

With regard to availability and convenience of dental care, the steady increase in the number of dentists in conjunction with the spread of better oral-hygiene habits among patients has enabled patients to secure appointments with dentists more easily today than was formerly possible.

An interesting departure from previous studies is the inclusion of two demographic variables in our study, namely,

age and sex. Women expressed greater levels of satisfaction with dental care than did men. According to Fox and Storms (1981) sociodemographic factors such as age and sex influence health care satisfaction and are strong predictors of health care utilization. Our results lend partial support to their findings. Though age is not a statistically significant predictor at the customary $\alpha = .05$ level, it is significant at the $\alpha = .1$ level, suggesting that age has a moderate amount of influence on dental satisfaction.

One reason may be that females have different expectations than males with regard to dental services, perhaps because of different utilization patterns. Aday, Anderson, and Fleming (1980), for instance, concluded that females made more visits to the dentist than males during the 1958-76 time period studied. Greater exposure as well as utilization of dental services possibly moderate their expectations, which, in turn, are more likely to be met. Another plausible explanation is that dentists treat women differently, though on the face of it, this sounds less likely.

Limitations and Directions for Future Research

Although the characteristics of the sample employed in our study as well as its size make it fairly representative of the U.S. population, caution must still be exercised in extending our conclusions to the entire U.S. population. Minority groups and new immigrants, for instance, might display behaviors different from those of the people sampled here.

A major concern in interpreting and drawing firm conclusions from our results is the reliability of the measures. The lower than ideal levels of reliability obviously attenuate the relationships tested here. With improved measures, it is possible that the model proposed here would account for a

TABLE 6

Analysis of Covariance Results					
Source of Variation	D.F.	Sum of squares	F-Value	P > F	R-squared
Model	6	323892.53	112.75	.000	
Waiting time	1	19911.10	41.597	.000	
Availability/convenience	1	13362.51	27.916	.000	
Continuity of care	1	28902.64	60.381	.000	
Cost of care	1	43854.19	91.617	.000	20.25%
Management of pain	1	51491.01	107.571	.000	
Age	1	1462.87	3.056	.081	
Sex	1	71555.96	14.950	.000	
Error	2723	1303416.4			
Total	2730	1634464.9			

greater proportion of the variation in consumer satisfaction with dental care.

Several issues relating to the measurement of the study variables must be addressed in future research. Satisfaction with health care is widely recognized to be a multidimensional construct (Singh 1990). The problem with the measures we employed appears to be the heterogeneity of the constructs. Waiting time, for instance, included time for getting an appointment as well as time spent at the dentist's office beyond the scheduled appointment time. Splitting the construct into multiple variables and employing multiple items should increase the reliability and render the results of hypothesis testing more meaningful.

Our study did not include such variables as quality of care and humaneness of dentists, which are becoming increasingly important in an intensely competitive marketplace. The contributions of these and other relevant variables need to be assessed in future research to extend our understanding of consumer responses to dental services.

Although the limitations of the present data set do not allow us to verify the validity of any of these alternate explanations, especially regarding the demographic factors, future research must deal with them. Methodologies such as Cohort analysis and models such as the gap model (Parasuraman, Zeithaml, and Berry 1985) could be employed to tease out the true contributions of variables such as gender and age.

Conclusions

Previously, Aday, Anderson, and Fleming (1980) concluded that factors such as waiting time and convenience do not appear to have much impact on consumer responses to health care providers. Findings from our study indicate that a significant proportion of the variation in consumer satisfaction with dental care can be explained by such variables as waiting time and continuity of care.

When competing care providers are well-matched in terms of cost, quality of care rendered, etc., variables such as waiting time are likely to become the determinant attributes in choosing the care provider. Dentists can benefit by emphasizing and competing on these variables. At a time when consumers are becoming more demanding, dentists and other health care providers must respond to these demands through an emphasis on factors influencing consumer satisfaction.

About the Authors

Pradeep Gopalakrishna, an Assistant Professor of Marketing and I.B. at Hofstra University in Hempstead, N.Y., received his PhD in marketing from the University of North Texas in 1988. His research interests are in the areas of health care marketing, patient satisfaction, cross-cultural marketing, and consumer behavior.

Venkatapparao Mummalaneni, an Assistant Professor of Marketing at St. Johns University in Jamaica, N.Y., received his PhD in marketing from Penn State. His research interests are in the areas of services marketing, patient satisfaction, and buyer-seller relationships.

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