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Applicability of both dentist and patient perceptions of dentists' explanations to the evaluation of dentist–patient communication

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Objectives: Very little is known about dentist–patient communicative behaviours in actual practice. This study evaluated dentist and patient perceptions of dentist–patient communication and patient outcome. ***Participants:*** The subjects were 171 dentist–patient pairs in Kitakyushu, Japan. ***Research design:*** Dentists and patients answered the same questionnaire items using the same response categories to evaluate dentist–patient communication. Based on the scores of patient and dentist perceptions with respect to dentist–patient communication, patient–dentist pairs were categorised into one of 3 groups. Data analyses used one-way ANOVA, multiple linear regression analysis, and multiple logistic regression analysis. ***Results:*** We found that, with respect to dentist–patient communication, patients in the 'patient better' group (*i.e.,* the patient's evaluation was more positive than the dentist's evaluation) were more likely to have a positive outcome (*e.g.,* 'improvement of health and fear,' 'satisfaction with care') than those in the other two groups. Patients in the 'doctor better' group (*i.e.,* the dentist's evaluation was the more positive) were more likely to have a negative outcome than those in the other two groups. ***Conclusions:*** A positive patient outcome is more likely when the patient's evaluation is better than a dentist's evaluation with respect to dentist–patient communicative behaviours. The method based on patient and dentist perceptions with respect to dentist–patient communication might be effective in evaluating dentist–patient communication.

Key words: *patient satisfaction, communication behaviour, perception, Japan*

Introduction

Patient satisfaction is an important outcome index used to evaluate the quality of medical care. Factors that are likely to be involved in a satisfactory outcome include patient-related factors such as age, sex, type and state of disease, length of outpatient treatment, and socio-economic factors, as well as doctor-related factors such as age, sex, and the department where patients are treated (Sitzia and Wood, 1997). Other factors are also important, including factors related to the medical facility (*e.g.,* clinic or hospital, number of patients treated in a day) and those related to patient–doctor communication (*e.g.,* number of questions, length of conversation, quality of communication) (Hall and Dornan, 1988). Research has shown that patient–doctor communication is closely correlated with patient satisfaction with the medical care received (Ong *et al.,* 1995).

A variety of measures have been used to evaluate patient–doctor communication (Ben-Sira, 1976; Hall *et al.*, 1988). As patient–doctor communication is an ongoing dynamic and interactive process in which both parties influence each other, any evaluations that focus on only one party have a disadvantage as they ignore part of the interaction. The Roter Interaction Analysis System (RIAS) is an effective method for evaluating the quality of patient–doctor communication which involves both parties and has been used in a number of studies (Levinson *et al.*, 1997; Takayama *et al.*, 2001). However, this system has some disadvantages. For example, it uses an objective third party to analyse the volume of information. This objective data is not to the same as a patient's subjective evaluation, which reportedly has a greater influence on perception of treatment outcome than does objectively evaluated information (Street, 1992). In addition, it can be difficult to obtain cooperation from both patients and doctors. Because of these concerns a new method for evaluating patient–doctor communication comparing physician's and patient's subjective evaluations of the physician's explanation to the patient was propsed (Hagihara and Tarumi, 2006; Hagihara *et al.,* 2006*)*.

Several reports of patient satisfaction with dental care (Arnbjerg *et al.*, 1992; Lahti *et al.*, 1995; Unell *et al.*, 1996) indicate that patient perception of outcome should be measured differently from the doctor's and that patient satisfaction is influenced by their expectations about treatment and perception of oral health. Several other studies have found a correlation between dentist–patient communication and perceived treatment outcome (Sondell and Söederfeldt, 1997).

In this study, we evaluated dentist–patient communication using the method developed by Hagihara and colleagues and investigated dentist–patient pairs to evaluate gaps between patient and dentist perceptions with respect to the level of dentist explanation to the patient. The current study was designed to: 1, clarify the relationship between dentist–patient communication and outcome as determined by the patient; 2, elucidate the characteristics

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of dentist–patient communication by comparing them with doctor–patient outcome evaluated using the same method. The findings should inform the development of dentist–patient communication.

Method

The study was conducted from October to December 2006 and the subjects were dentist members of a dental association in Kitakyushu, Japan and their patients. Dentists were sent an initial questionnaire and the patients of those expressing interest were selected by the dentist handing a questionnaire package to up to 5 visiting patients during a given time slot of each hour (e.g., the second patient each hour). For each such patient immediately after the consultation, the dentist evaluated the communication with that patient and returned the completed questionnaire to us by mail.

To ensure the dentist's presence did not influence patient's answers: 1) a letter assured patients that neither the dentists nor the dental association would have access to completed questionnaires; 2) a letter assured patients that the survey was completely anonymous; 3) patients answered their questionnaire at home; and 4) patients mailed the completed questionnaire directly back to us.

The questionnaires for dentists and patients included the same items and response categories for evaluating their communication. Table 1 lists the variables used to analyse the association between dentist and patient perceptions with respect to their communicative behaviours. There are 3 categories of response: 'dentist explanation,' 'reflection of patient request,' and 'dentist explanatory behaviour.' Specifically, both questionnaires (Figure 1) used 5-point Likert scales for responses for the level of dentist explanation (7 items) and the reflection of patient request (5 items). To quantify the association between patient and dentist perceptions of communicative behaviours, the gap between perceptions was calculated for each patient–dentist pair (*i.e.,* patient score minus dentist score for clusters 1-3).

To analyse patient outcome variables, the patient questionnaire also included items about their understanding of the dentist's explanation (Figure 1,Clusters 4-8). For clusters 4 to 6 the scales showed high reliability with Cronbach's α values of 0.94, 0.94 and 0.88. We conducted a factor analysis (principle components with Varimax rotation) for patient impressions of the dentist and isolated 3 clean, strong clusters: dentist 'friendliness,' 'impatience,' and 'arrogance.' Respondents rated each of these using 5 items (Cluster 7). The reliability indices were high for all 3 scales at 0.92, 0.82, and 0.95, respectively.

Finally, we used factor analysis for poor compliance and isolated two clean, strong clusters: patient 'self-regulation' and 'disregard of advice.' Respondents rated these using 5 and 4 items, respectively (Cluster 8) where higher scores indicated greater patient self-regulation or disregard of dentist advice. The reliability indices were high for the two scales at 0.87 and 0.85 respectively.

Based on the scores for perceptions about communicative behaviours during patient–dentist interaction ('dentist explanation,' 'reflection of patient request,' and 'dentist explanatory behaviour'), patient–dentist pairs were categorised into one of 3 groups: 'patient better,' 'concordance,' and 'dentist better.' (Street, 1992). Specifically, in each dentist–patient pair, if the patient's score exceeded the dentist's score, the pair was classified as 'patient better;' if the dentist's score was the higher then the pair was classified as 'dentist better;' and if the scores were similar the pair was classified as 'concordant' (Figure 2).

First, to examine whether the 3 situations influenced patient outcome measures, eight outcome measures were compared among the 3 groups ('patient better,' 'dentist better,' 'concordance') using a one-way ANOVA. Second, to evaluate associations between those 3 patient–dentist groups and patient outcome measures, we conducted

Table 1. Mean, standard deviation and range of study variables

	Mean (sd)	*Range*	*Cronbach's α*
Patient and dentist responses about the level of dentist communication behaviours [a]			
Dentist explanation	1.48 (5.48)	-11 to 17	0.89
Reflection of patient request	1.69 (4.28)	-6 to 14	0.78
Dentists' explanatory behaviour	1.70 (5.03)	-11 to 12	0.85
Patient outcome variables			
Understanding of the dentist's explanation	29.04 (4.58)	15 to 35	0.94
Improvement of health and fear	14.99 (3.87)	7 to 20	0.94
Satisfaction with care	17.80 (2.67)	7 to 20	0.88
Impressions of the dentist (friendliness)	21.61 (3.53)	10 to 25	0.92
Impressions of the dentist (impatience)	9.95 (4.45)	0 to 25	0.82
Impression of the dentist (arrogance)	7.14 (3.70)	0 to 25	0.95
Poor compliance (self-regulation)	18.78 (3.57)	12 to 24	0.87
Poor compliance (disregard of advice)	12.10 (2.68)	4 to 16	0.85

[a] Patient's score – dentist's score.

Cluster 1. Dentist explanation *(scale: 1, very insufficient, to 5, very sufficient)*
1. Dentist explanation of the name of disease.
2. Dentist explanation of the condition of the disease.
3. Dentist explanation of the prognosis for the disease.
4. Dentist explanation of the treatment method.
5. Dentist explanation of the treatment effects.
6. Dentist explanation of the treatment period.
7. Dentist explanation of the treatment prognosis.

Cluster 2. Reflection of patient request *(scale: 1, very insufficient, to 5, very sufficient)*
1. Reflection of patient request in treatment policy.
2. Reflection of patient request with regard to treatment methods.
3. Reflection of patient request regarding the treatment period.
4. Reflection of the patient request regarding the treatment expenses.
5. Consideration of patient pain control.

Cluster 3. Dentist explanatory behaviour *(scale: 1, strongly disagree, to 5, strongly agree)*
1. The dentist answers a question from the patient.
2. The dentist confirms patient understanding.
3. The dentist explains to the patient using plain words.
4. The dentist respects patient privacy.
5. The dentist takes sufficient time for explanation.
6. It is an easy atmosphere in which to ask the dentist a question.
7. It is the explanation that was requested.

Cluster 4. Understanding of the dentist's explanation *(scale: 1, do not understand at all, to 5, understand very well)*
1. Understanding of the dentist's explanation of the name of disease.
2. Understanding of the dentist's explanation of the condition of the disease.
3. Understanding of the dentist's explanation of the prognosis for the disease.
4. Understanding of the dentist's explanation of the treatment method.
5. Understanding of the dentist's explanation of the treatment effects.
6. Understanding of the dentist's explanation of the treatment period.
7. Understanding of the dentist's explanation of the treatment prognosis.

Cluster 5. Improvement of health and fear *(scale: 1, very bad, to 5, very good)*
1. How is your oral health improving?
2. How is the alleviation of your worry or anxiety regarding oral health?
3. How is your pain control?
4. How is your mental condition after treatment?

Cluster 6. Satisfaction with care *(scale: 1, strongly disagree, to 5, strongly agree)*
1. I am satisfied with the care.
2. I am satisfied with the results of the treatment.
3. If I need care again in the future, I will consult with this dentist.
4. If my family or friends need care in the future, I will recommend this dentist.

Cluster 7. Impressions of the dentist
Friendliness
1. My dentist is friendly.
2. My dentist tries to talk to me.
3. My dentist shows interest when I talk.
4. It is easy to ask my dentist a question.

Impatience
1. I feel that my dentist is impatient and sends me away during the treatment.
2. Treatment time is too short.
3. My dentist is silent.
4. My dentist does not allow me to give my opinions freely.
5. My dentist does not pay enough attention to my anxiety.

Arrogance
1. My dentist downplays my opinions.
2. My dentist downplays my pain.
3. My dentist's attitude is rude.
4. My dentist attributes the cause of a poor outcome to the patient.
5. My dentist does not pay a lot of attention to me when talking about an important topic.

Cluster 8. Poor compliance
Self-regulation
1. I forgot to take the medicine I was given.
2. I made a mistake in when I took the medicine.
3. I chose to reduce the frequency of the medicine I was given.
4. I chose to reduce the dosage of the medicine I was given.
5. I chose to stop taking the medicine I was given.

Disregard of advice
1. I ignore advice about oral health.
2. I ignore advice about dental flossing and the inter-dental brush.
3. I ignore advice about eating between meals.
4. I ignore advice about smoking.

Figure 1. *Questionnaire items for assessing dentists' explanations*

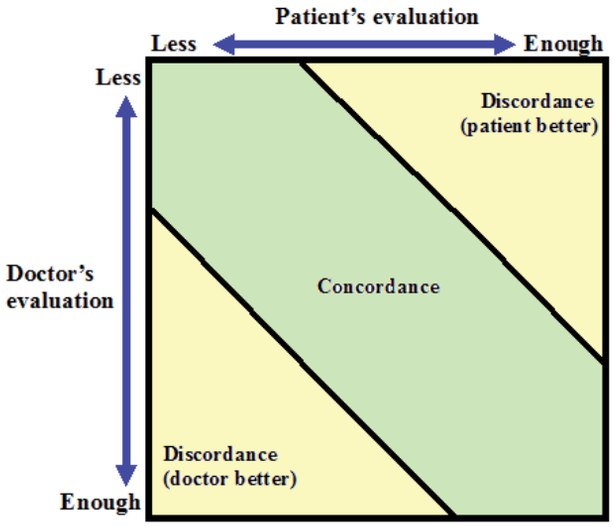

Figure 2. *Patient and doctor evaluations of the sufficiency of doctor explanations in medical encounters (after Street, 1992)*

multiple linear regression analyses with patient outcome as a dependent variable and with the 3 groups, patient gender, patient age, length of treatment time, dentist age, and type of dental practice as independent variables. Third, because we found that patients in the 'dentist better' group were more likely to have a poor outcome, we conducted a stepwise multiple logistic regression analysis with the worst situation (1, yes; 0, no) as a dependent variable and patient or dentist attributes as independent variables, and used the results to identify the related factors. All statistical analyses were carried out using SPSS for Windows (v.11.0; SPSS Inc., Chicago, IL).

Results

Of 222 dentists contacted, 45 (20%) returned questionnaires. Of the 1,110 patients given questionnaires, 189 (17%) returned them. Dentists or patients who did not constitute a dentist–patient pair were excluded leaving 171 dentist–patient pairs for analysis, 45 dentists and 171 patients.

The dentists had a mean age of 56 years (sd 10, range 41-78) and 95% were male. Their mean length of clinical experience was 30 years (sd 10, range 14-52) with 56% of their practices focusing on treatment only rather than both treatment and prevention. Patients had a mean age of 53 years (sd 17, range 8-83) and 39% were male. Treatment sessions had a mean length of 43 (sd 44) minutes per session. The mean differences between patient and dentist scores for level of dentist explanation, reflection of patient request, and dentist explanatory behaviour were 1.48 (sd 5.48), 1.69 (sd 4.28), and 1.70 (sd 5.03), respectively (Table 1). Overall patients scored higher than dentists for all items.

The mean values for the 8 outcome variables by the 3 groups ('concordant,' 'patient better,' and 'dentist better') are presented in Table 2. For example, with regard to patient and dentist impressions of the dentist's explanation, significant differences appeared between 2 of the 3 pairs compared (*i.e.,* not 'patient better' vs. 'concordance,' but both 'concordance' vs. 'dentist better,' and 'patient better'

Table 2. Association between groups based on the scores for perceptions about communicative behaviours and patient outcome variables

	Dentist explanation - mean (sd)						*Reflection of patient request - mean (sd)*						*Dentist explanatory behaviour - mean (sd)*					
	Patient better (a)	*Concord (b)*	*Dentist better (c)*	*Multiple comparison*			*Patient better (a)*	*Concord (b)*	*Dentist better (c)*	*Multiple comparison*			*Patient better (a)*	*Concord (b)*	*Dentist better (c)*	*Multiple comparison*		
	n=30	*n=32*	*n=27*	*a-b*	*b-c*	*a-c*	*n=42*	*n=47*	*n=32*	*a-b*	*b-c*	*a-c*	*n=31*	*n=32*	*n=30*	*a-b*	*b-c*	*a-c*
1.Understanding of the dentist's explanation	32.3 (3.0)	29.9 (3.5)	24.8 (5.2)	NS	**	**	32.0 (3.6)	29.2 (3.6)	26.0 (5.0)	**	**	**	32.3 (3.0)	29.9 (3.5)	24.8 (5.2)	**	**	**
2 Improvement of health and fear	17.7 (2.5)	15.3 (3.0)	11.8 (2.8)	**	**	**	17.3 (3.2)	15.3 (3.1)	12.8 (3.7)	**	**	**	17.7 (2.5)	15.3 (3.0)	11.8 (2.8)	**	**	**
Patient outcome variables																		
3. Satisfaction with care	19.3 (1.2)	18.0 (2.8)	15.8 (3.0)	NS	**	**	19.0 (1.7)	18.1 (2.5)	16.4 (2.9)	NS	**	**	19.3 (1.2)	18.0 (2.8)	15.8 (3.0)	*	**	**
4. Impression of the dentist (friendliness)	23.4 (2.4)	22.3 (3.0)	19.0 (4.1)	NS	**	**	23.4 (2.4)	21.9 (3.1)	19.6 (4.1)	NS	**	**	23.4 (2.4)	22.3 (3.0)	19.0 (4.1)	NS	**	**
5 Impression of the dentist (impatience)	7.7 (3.1)	10.5 (4.7)	10.9 (3.8)	**	NS	**	9.0 (5.1)	8.8 (3.1)	12.0 (4.1)	NS	**	**	7.7 (3.1)	10.5 (4.7)	10.9 (3.8)	**	NS	**
6. Impression of the dentist (arrogance)	5.7 (1.3)	6.9 (4.1)	8.8 (3.6)	NS	NS	**	6.1 (3.5)	6.3 (2.3)	8.7 (3.2)	NS	**	**	5.7 (1.3)	7.0 (4.1)	8. 8 (3.6)	NS	NS	**
7. Poor compliance (self-regulation)	19.7 (4.0)	18.5 (3.5)	18.8 (3.8)	NS	NS	NS	19.7 (3.7)	18.5 (3.8)	17.8 (3.4)	NS	NS	NS	19.7 (4.0)	18.4 (3.5)	18.8 (3.8)	NS	NS	NS
8. Poor compliance (disregard of advice)	12.4 (3.6)	12.6 (2.4)	11.7 (2.6)	NS	NS	NS	13.2 (3.0)	12.2 (2.4)	11.3 (3.0)	NS	NS	NS	12.4 (3.6)	12.6 (2.4)	11.7 (2.6)	NS	NS	NS

One-way ANOVA. * p<0.05. ** p<0.01, NS, not significant.

vs. 'dentist better') (all $p<0.01$). Table 2 also indicates that the 'dentist better' group might have had more negative patient outcome measures than the other conditions, so we used a stepwise multiple logistic regression analysis to isolate factors related to the 'dentist better' classification (Table 3). Compared to treatment plus prevention, a treatment only practice was 4.56 times more likely to result in the 'dentist better' classification (95% CI 1.32–15.70) and with regard to dentist explanatory behaviour, the same type of practice was 3.63 times more likely to result in the 'dentist better' classification (95% CI 1.25–10.53).

Discussion

Our results produced several interesting findings. First, mean patient outcome values were significantly higher in the 'patient better' group than in the other two groups. Furthermore, with regard to patient outcome variables, although there were significant differences between the 'dentist better' group and the other two groups, there was no difference between the 'patient better' and 'concordance' groups (Tables 2). When a previous study applied this method to assess doctor–patient communication, results indicated that patient outcomes were better in the 'patient better' group and worse in the 'doctor better' group (Hagihara and Tarumi, 2006). This result supports our finding. Few studies have focused on patient satisfaction with specific dental treatments. In the 1980s, studies began to focus on factors related to patient satisfaction with dental care (Alvesalo and Uusi-Heikkilä, 1984; Schuurs *et al.*, 1980) and researchers developed a dental patient satisfaction index, with which patients independently evaluate their satisfaction with treatment (Davis and Ware, 1981). In the 1990s, Lahti *et al.* (1996) studied dentist and patient opinions about ideal dental treatment by dentists. They found that patients and dentists shared similar opinions, except for opinions about the most desirable dentist–patient relationship. Recently, to verify patient preferences about decision-making styles, Schouten *et al.* (2003) conducted an extensive study using a content analytical method involving videotaped dentist–patient interactions in, for the first time, dental settings. However, this kind of study has inherent disadvantages: the process is costly and time-consuming and securing patient consent is difficult. We chose the method developed by Hagihara *et al.,* (2006) which measures discrepancies between evaluations of the quality of dentist explanation to patients and evaluates patient–dentist communication. Concomitant with findings about physician–patient communication, we found that patient satisfaction was lower when the dentists evaluated their explanations more highly than patients did. This finding may be very helpful as identifying factors affecting dentist–patient communication may help to improve the quality of dentist–patient communication. Thus, the method used in this study, which evaluates a gap between the patient's and dentist's perceptions with respect to the level of the dentist's explanation to patients, may be an effective approach in terms of practical implications such as cost, manpower, time and usefulness of findings.

Second, we found that the treatment only type of dental practice was associated with 'dentist better' classification (Table 3). Unlike findings about physician–patient communication, our results did not indicate that length of clinical experience and patient gender were predictors of 'dentist better' classification (Hagihara and Tarumi, 2006). Preventive dentistry requires daily oral care by patients at home and therefore requires extensive guidance by dentists, which is not the case when dentists administer only ordinary treatments. Furthermore, patients of clinics with a preventive focus tend to have more regular appointments. Several studies have reported that patients who regularly visit dental clinics have values about dental treatment that differ from those who do not in that they value highly the outcome of treatment, whereas patients who visit dental clinics irregularly value highly the process of treatment (Goedhart *et al.*, 1996). Another study reported that unhealthy patients regularly visit physicians, whereas healthy patients regularly visit dentists (Maier, 1996). Dentists who practice preventive treatment in addition to regular treatment seem to explain conditions and treatments to their patients well. The number of regular patients probably increases when dentists offer a more detailed explanation, although a longitudinal study would be required to test this hypothesis.

Third, this study measured 3 types of dentist communicative behaviours (the level of dentist explanation, reflection of patient request, and dentist explanatory behaviour). Hagihara and Tarumi (2006) used only one index of physician–patient communication: the level of physician explanation to a patient . Although we measured dentist–patient communication in 3 different ways, we observed extremely similar findings for the 3 measures suggesting that any one of the 3 indices could be used. It is interesting to note that the specific contents of verbal

Table 3. Stepwise multiple logistic regression analyses of factors related to the dentist-better groups in the patient-dentist interaction (n= 87)

	Dentist explanation		*Reflection of patient request*		*Dentists' explanatory behaviour*	
	β	*SE*	*β*	*SE*	*β*	*SE*
1. Dentist age (years)	0.039	0.20	0.014	0.20	0.028	0.02
2. Patient age (years)	-0.017	0.02	-0.014	0.01	-0.026	0.02
3. Patient gender [a]	-0.252	0.56	0.161	0.46	0.607	0.57
4. Length of treatment session (mins)	0.012	0.01	0.008	0.01	-0.013	0.01
5. Type of dental practice [b]	-1.517[c]	0.63	-0.537	0.46	-1.290[c]	0.54

SE, standard error. [a]1, male, 0, female. [b]1, Treatment and prevention; 0, Treatment only. [c]$p<0.05$

as well as nonverbal communication, such as the reflection of patient requests and dentist explanatory behaviour (*e.g.,* 'the dentist takes sufficient time for explanation,' 'the dentist has a tendency to ask questions,' etc.), can be used as a measure to evaluate dentist–patient communication.

Fourth, we did not observe any significant differences among the 3 groups in terms of poor compliance (Table 2). No previous studies have focused on how patient satisfaction affects oral hygiene or modification of eating behaviour, but some have reported that the level of patient satisfaction affects patient attitude toward dental consultation and treatment (Albrecht and Hoogstraten, 1998). Our results did not indicate that any factors related to compliance were related to dentist–patient communication. It might be difficult to evaluate how patient satisfaction with dental care influences patient compliance using the cross-sectional methodology of this study. To elucidate this subject, future research should conduct long-term observation of factors such as treatment period.

Our study had certain limitations. The low response rate was a considerable problem; it might have resulted from poor explanation of the study goals and of confidentiality for participating dentists and patients. In addition, empirical studies of communication are rarely performed in a clinical setting, especially with regard to dentistry in Japan. Both dentists and patients might have felt uncomfortable voicing their opinions in such a closed community. Due to the low response rate, the data might not accurately reflect dental practices in the area, so it is important to be careful when extrapolating the findings to other settings. In addition to the low response rate, the reliability of our results might be problematic. Initially, 5 patients were assigned to each dentist; some dentists were able to obtain responses from all 5 patients, whereas other dentists were not. The results could therefore be biased due to bias in dentist and patient responses.

Finally, we applied a method previously established as effective for evaluation of physician–patient communication to evaluate dentist–patient communication. Despite some limitations our experimental results suggest that this method might be effective for evaluation and a tool for the improvement of dentist–patient communication.

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