Monitoring patient satisfaction with university dental services under two fee-paying systems

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Abstract

Objectives: This survey aimed to study patients' satisfaction with the dental service of a university in Hong Kong under a recently introduced item-based fee-paying system and reasons for non-attendance at the clinic; and to compare results of the present survey with that of a similar survey of the same dental service under a time-based fee-paying system in 1996.

Method: A modified Dental Satisfaction Questionnaire was distributed to a random sample of students (n=194) in their lecture rooms and they were asked to complete the questionnaire on the spot. The same questionnaire was sent to a random sample of staff and their spouses (n=207) by mail.

Results: Dental Satisfaction Index (DSI) scores calculated from the returned questionnaires were 66 for students and 70 for staff and their spouses. Compared to the scores in 1996, there was no significant difference for that of the students (DSI = 65 in 1996) but a significant improvement in that of the staff and their spouses (DSI = 66 in 1996). Moreover, in the present survey, 'busy/no time' and 'no perceived dental problem', instead of 'long waiting time for an appointment' in the 1996 survey, were the major reasons for non-attendance.

Conclusion: The recent attempts by the University Dental Clinic to shorten patient waiting time and the change in fee-paying system might have improved the patients' satisfaction of the service.

The on-campus University Health Service (UHS) dental clinic is established to provide dental service to the full-time and part-time students , and staff and their dependants of the University of Hong Kong (HKU). The aim of the dental clinic is to prevent dental disease and to provide comprehensive general dental care for the eligible patients. The dental service is run by the university and monitored by a Health Service Management Committee (HSMC). Members of the HSMC include university administrators, representatives from university staff and students and the Director of the UHS. Operation of the dental clinic is similar to that of a group private general dental practice. There are five dental surgeons, three dental hygienists and ten supporting staff working in the UHS dental clinic. In 1999, the number of staff and dependants was 12,000 and that of students was 15,500. The dentist to client ratio was around 1 to 5,500.(1)

Cost of the dental service is heavily subsidized by the university. The cost recovery rate of total service income was 20 per cent in 1997. Before February 1999, the patients were charged according to the length of treatment time irrespective of the type of treatment. Undergraduate students and junior staff (unskilled workers) and their dependants paid the lowest scheduled fee, senior staff (teaching staff and administrators) and their dependants paid the highest dental charges, while postgraduate students and staff of intermediate rank (for example, technicians and secretaries) paid at the middle level of the fee scale. In addition, patients had to pay all the laboratory charges for the dental work involved. The dental appointments were always fully booked and patients had to wait for two months a routine appointment.

In 1996, a patient satisfaction survey was conducted to evaluate the dental service.(2) It was found that the consumers were generally satisfied with the service but they were not satisfied with the long waiting time for an appointment. At the same time, the HSMC carried out a review of the university health service and pointed out that the University's expenditure on health care had increased rapidly between 1991 and 1997. Staff of the dental clinic were asked to carry out the service in a more cost-effective manner so that the university could reduce its subvention to prevailing market price.

In response, the UHS dental service introduced an item-based fee-paying system to replace the time-based system in February 1999, so that a more direct and easy comparison with the private market could be made. Under the new fee-paying system, patients paid a cost

that was about 20 to 40 per cent of the median prevailing market dental charge depending on treatment item.(3) In addition, associate dentists remunerated on item basis were recruited to replace salaried senior dentists who retired or resigned. This method of remuneration is likely to encourage these associate dentists to increase their productivity and to work more efficiently.(4,5) A financial audit of the UHS dental service carried out in early 2000 reported that there was an increase in the cost recovery rate from 20 per cent in 1996 to 40 per cent in 1999. Meanwhile, the volume of service provided as measured by treatment procedures completed had increased by 15 per cent. Such increase in productivity is not surprising as item-based fee-paying system tends to increase dentists' incentive to provide more service per patient visit.(6, 7)

From the administrators' point of view, the reforms of the UHS dental clinic had produced good results since both the cost recovery rate and productivity increased. This suggests that the clinic can function with less subvention from the university. Such encouraging results, however, may not mean much to the consumers. This is because the reforms cannot be regarded as successful if the quality of dental care is jeopardized.

Provision of high quality care is important to both public and private dental service providers. 'High quality care or good dentist' was rated as the third most important reason for choosing dentists by the adults in Hong Kong.(8) In fact, quality is so important that it has to be perceived by the patient and reflected in every activity and not just in the product provided.(9) However, quality of care can be difficult to define since patient's and dentist's criteria of quality care may differ.(10) Increasing emphasis is now being placed on measuring patient satisfaction.(11,12) Dissatisfaction with dentists is a main reason for changing dentists and that patient satisfaction affects a patient's decision on whether or not to return for more dental treatment.(9,13,14) Thus, knowing patients' perception of the current service is important for achieving a better match of a dental clinic's performance with the patients' expectations. In so doing, one could also identify aspects of a service that require improvement.(13)

For continual improvement, the quality of dental service should be regularly monitored.(15) A useful way to do this is to regularly conduct surveys on patient satisfaction of the service. Results from each satisfaction survey can aid in identifying patients' expectation and perception of a service at a particular point in time. Thus, consecutive surveys on patients' satisfaction of a service over time will enable the detection of changes in the quality of a dental

service. No information on the effect of switching from a time-based to an item-based fee-paying system on patients' satisfaction was found in a search on the dental literature. Thus, the reform which took place in the dental clinic of the University of Hong Kong provided an opportunity for a study on this aspect.

The objectives of the present study were first, to study patients' satisfaction with the latest dental service provided by the University Health Service; second, to identify reasons why some patients chose not to use the dental service; third, to compare the finding of this survey with that obtained from a similar study conducted in 1996 when the old fee-paying system was in place.

Material and Methods

Information from individuals in the study was obtained through the use of a self-administered questionnaire.(2) The design of the questionnaire was based on the 19-item Dental Satisfaction Questionnaire (DSQ) developed by Davis and Ware,(16) and it was modified to use personal referent. The original 19-item DSQ was designed to evaluate patient's satisfaction with dentist's performance only, but the questionnaire used in this study was expanded by adding questions on patient's satisfaction with the performance of other dental team members, namely receptionists, dental hygienists and dental surgery assistants. The modified DSQ was translated into Chinese, and the bilingual questionnaire had been used successfully to measure patient satisfaction with the UHS dental service in 1996.(2) The questionnaire contained a list of statements about various aspects of dental care and the participants were asked to indicate their degree of agreement with the statements on a 5-point Likert scale (strongly agree; agree; not sure; disagree; strongly disagree). The items were mainly categorized under five dimensions which included 'access', 'availability/convenience', 'cost', 'pain' and 'quality' (Table 1). The questions were randomly arranged and asked in either a positive or negative way in order to minimize inertial responses given by respondents.

This survey was conducted in February 2000. The study population was divided into two groups, 1) students and 2) university staff and their spouses. The sample size required was estimated with reference to the 1996 survey findings.(2) First, it was assumed that the standard deviation of the DSI score of the subjects in the new survey would be the same as that of the subjects surveyed in 1996. Result of a calculation showed that if the numbers of dental service

users surveyed in 1996 and 2000 were similar, i.e. about 90, then there would be a 90% power to detect a 3% difference in the DSI scores between the two samples when a two tailed two-sample t-test was used with the level of significance set at 0.05. This seemed appropriate for this study. Finally, the number of persons to be approached in the new survey was set at a higher number than that of the 1996 survey so that the same power could be maintained even if the subject response rate in the new survey turned out to be 10-20% lower than that of the former survey.

Survey of the students was carried out jointly by the UHS dental service and the students union of the university. A total of 194 students were selected by the representative of the students union using a random cluster sampling procedure described below. Seven courses were selected with the aid of a random number table from the complete list of degree courses published by the university. For each selected course, a staff of the dental service together with a representative from the students union went into the relevant lecture room and invited no more than 30 students to fill in the questionnaire. The questionnaires were distributed to the students in the lecture rooms during a break or at the end of a lecture. The students were asked to complete the questionnaire on the spot and to return them to the investigators before they left. Courses for first year students were excluded from the sampling so that only students who had been studying at the university for more than a year were asked to complete the questionnaire.

Two samples of 104 staff each were selected by the University Computer Centre through stratified random sampling. All university staff were first divided into five groups, namely substantive senior staff, substantive staff of intermediate rank, substantive junior staff, staff on short term contact and temporary staff. The number of staff selected from a particular group was proportional to the size of that group in the total staff population. Questionnaires were sent to the staff members in the first sample and to the spouses of the staff in the second sample. Staff working in the University Health Service and their spouses were excluded from the sample so as to avoid biased answers. Questionnaires were sent to the selected individuals together with an explanatory letter and a return envelope. A reminder letter was sent two weeks later to encourage them to return the questionnaire.

The data collected were entered into a computer and analyzed with the software SPSS. The prorated means and the mean score expressed as a percentage of the highest possible score

of the five dimensions of satisfaction ('access', 'cost', 'availability/convenience', 'pain' and 'quality') were computed and the Dental Satisfaction Index (DSI) was constructed. The DSI included all items from the five dimensions as well as those measuring general satisfaction and continuity of dental care. The original score of each item ranged from one to five and these scores were converted according to the direction of the wording in the statements so that after conversion a higher score indicates greater satisfaction. The DSI is the sum of the item scores. Mean scores and prorated means were also computed for each dimensions of the DSI. Two-sample t-test was performed to compare the differences in mean scores between the students' responses in 1996 and that in 2000. The same statistical test was also applied to assess the staff responses in 1996 and 2000. Chi-square tests were used to evaluate the differences in distribution of the reasons for not using the UHS dental service given by the students and the staff and their dependants in 1996 and 2000. The level of statistical significance was set at 0.05.

Results

In this survey 194 questionnaires were distributed to university students. Ten students said they had to hurry to the next lecture and did not stay to complete the questionnaire. Thus, only 184 questionnaires were collected and the response rate was 95 per cent. Among the 207 questionnaires mailed to the eligible staff and their spouses, 127 completed questionnaires were returned. The response rate was 63 per cent.

The utilization rate of the students in 2000 as measured by the percentage of students who had attended the UHS dental clinic was 72 per cent, whereas that of the staff was 71 per cent (Table 2). When compared to the 1996 survey, there was an increase of 9 per cent for the students and 7 per cent for the staff. However, these differences were not statistically significant.

The mean scores and standard deviations of the scores of the 23 dental satisfaction items answered by the students are shown in Table 3. The mean scores in 2000 ranged from 2.0 (item 3) to 4.2 (item 13), whereas the mean scores in 1996 were between 1.6 (item 13) and 4.2 (item 1). In 2000, there were three items with a mean score below the scale mid-point and these were 'cost', 'waiting time at the dental clinic' and 'general satisfaction'. There were significant differences between the 1996 and 2000 results in some categories of satisfaction but the overall DSI score had no significant change. When compared with the survey carried out in 1996,

students in 2000 were more satisfied with 'availability/convenience', 'access' and 'quality (interpersonal)' of the dental service. However, they were less satisfied with the 'cost' and 'pain management'. There were no significant changes in the satisfaction with 'continuity of care', 'quality (technical, prevention and outcome)' and 'general satisfaction'.

The mean scores and the standard deviations of the scores of the 23 dental satisfaction items answered by staff and their spouses are shown in Table 4. It can be seen that they were generally satisfied with the dental service in 2000. The mean score of the 23 items ranged from 2.1 (items 3 and 5) to 4.2 (items 1, 4, 13 and 22). The DSI score of the 2000 respondents was higher than that of the 1996 respondents, 70 *vs* 66, and this difference was statistically significant (p=0.001). When compared to the results of the 1996 survey, staff and their spouses in 2000 were more satisfied with the 'access', 'availability/convenience', and 'quality (technical and interpersonal)' aspects of the UHS dental service.

The reasons given by students who had never used the university dental service are listed in Table 5. It was found that a significantly smaller percentage of students in 2000 complained of long waiting time for an appointment (p=0.005). In addition, significantly fewer students opted not to use the UHS dental service because they sought private dental care (p=0.037). 'Busy/no time' and 'no perceived dental problem' were still the main reasons that students did not use the dental service. Cost was not an important issue for not using the UHS dental service.

Similar to the students' responses, there was a significant reduction (p<0.001) in the percentage of staff and their spouses who did not use the UHS dental service due to long waiting time between the 1996 and 2000 surveys (Table 6). 'No perceived dental problem', 'busy/no time' and 'high fee' were the three most common reasons given by the non-users.

Discussion

With the reform made at the UHS dental clinic, it was imperative to evaluate the appropriateness of the changes and this also provided an opportunity to assess consumers' satisfaction with the dental service under two different fee-paying systems. The present survey followed a similar protocol that was employed and carried out smoothly in 1996.(2) The same

modified DSQ, originally developed by Davis and Ware16 was used in this study. Identical inclusion and exclusion criteria for the university courses and staff and their spouses were employed in both surveys. The same method of random sampling was employed. These allow valid comparisons to be made with the 1996 patient satisfaction survey.

A response rate of 95 per cent from the students was very good. The co-operation of the university teachers who allowed the questionnaires to be distributed, completed and collected on the spot, together with the direct contact and invitation from the investigators probably accounts for this favourable response rate.

A response rate of 63 per cent from the staff and their spouses is considered satisfactory for mailed questionnaire surveys in Hong Kong.(3) Although other methods such as telephone interview may lead to a higher response rate, it is considered inappropriate for a consumer satisfaction survey because anonymity of the respondents is very important for obtaining a valid response.

The DSI scores of the present patient satisfaction survey are similar to those obtained in the USA using Davies and Ware's original DSQ.(12,16) The overall DSI scores of the present survey ranged from 65 to 70, indicating that both the students and the staff were satisfied with the latest dental service provided by the university dental clinic. On the other hand, the DSI for the area of 'general satisfaction' for both patient groups were below scale mid-point. The validity of this particular area is doubtful as it was only measured by a single negatively worded statement in the questionnaire. It is unsure whether this single DSI score represents merely a subjective impression of the dental service as a whole; or that there are other unknown aspects of the dental service which contribute to the overall satisfaction. One method to investigate this is to hold focus group interviews with the patients. In so doing, one will be able to explore areas not mentioned in the questionnaire which may contribute to patient satisfaction. Then necessary improvements can be made to enhance the quality of dental service.

When compared to the results of the patient satisfaction survey conducted in 1996, both patient groups in this survey were more satisfied with the 'access', 'availability/convenience' and 'quality (interpersonal)' aspects of the dental service. This observation indicates a possible improvement in these three aspects of the dental service since 1996. Improvement in the aspects of 'access' and 'availability/convenience' is not surprising since the dental clinic managed to

shorten the waiting list for appointments from approximately two months in 1996 to within three weeks in 2000. As for the 'quality (interpersonal)' aspect, after noting the results of the 1996 patient satisfaction survey the clinic receptionists were asked to look into their manners in dealing with patients, and particularly to students. Consequently, the receptionists might have performed better in the interpersonal aspect towards both groups of patients.

Compared to the 1996 survey results, the student respondents in this survey were less satisfied with the cost of dental service at the UHS. One explanation for the dissatisfaction with the cost of UHS dental service is that the students have consumed more dental treatment in the recent years. According to the University Health Service Annual Reports,(1,17) consumption of dental service by the staff and their spouses remained the same between 1996 and 1999 while that of the students rose from an annual average of 1.6 to 1.8 service items per student attending the UHS dental clinic. Consequently, even if there was no increase in the dental treatment charges, with the growing service consumption by the students, their dental fees would increase annually. As such, the overall dental service charge may be perceived as high by the students.

Furthermore, under the item-based fee-paying system, the necessary process of discussing the charge of each treatment procedure with the patient may have made the students become more aware of the cost of dental treatment. On the other hand, under the time-based fee-paying system, discussion of treatment charge was not as essential, since the patient would automatically know how much was the charge from the length of a given appointment. Moreover, all students knew about the reduction in subvention to the UHS dental service. This would easily have induced a subjective intuition that there was an increase in dental service charges under the new fee-paying system.

Similarly, the university staff and their spouses were less satisfied with the cost of dental service in the present patient satisfaction survey than in the 1996 survey. Besides the possible reasons given above, the observed dissatisfaction with the dental fees by the staff and their spouses may be explained by the social equity theory.(18) This theory is based on the concept of social comparison which proposes that comparison of the inputs entered and outputs received by other consumers with oneself will influence one's formation and evaluation of opinions. In the present situation, comparison is made on the difference in the rate of dental service charge. The fact that the staff and their spouses are being charged at a higher rate than

the students may lead to the perception that the dental fees are too high for them and that the fees should have been lower. Furthermore, this can also give rise to an impression that they are subsidizing the students. Thus, creating a feeling of inequality. Moreover, the staff and their spouses, particularly those belonging to the group with the highest rate of payment, are being charged at a rate approaching the median dental fees in the private market.(3) In fact, 'high dental fee' is rated as the second major reason for non-attendance at the university dental clinic in both the 1996 and the present patient satisfaction survey.

In the 1996 survey, 'long waiting time for an appointment' was the most important reason for not using the university dental service. Since then, the UHS had consciously tried to shorten patient waiting time to improve patient access to the university dental service. In the 2000 survey, access was no longer the prime reason for non-attendance in both patient groups. Instead, whether the individual perceived oneself as being too busy or that there was no perceived need for dental treatment had become more important in determining attendance.

Another important finding in the present survey was that significantly fewer students did not use the university dental service because they sought private dental care. Such a finding may indicate a considerable improvement in the access to the UHS dental service. In other words, access to the dental service is improved to the extent that fewer students considered using private dental care in favour of the UHS dental service. This is consistent with the substantial increase in the patient satisfaction with access to the university dental service.

The top two reasons ('no perceived dental problem' and 'busy/no time') for not using the UHS dental service are similar to that of other studies on the use of dental services by adult Chinese in Hong Kong,(8) adult South Australian employees(19) and adult Singaporeans.(20) It has been suggested that having 'no perceived dental problem' and being 'busy/no time' for dental treatment reflect a lack of dental health awareness, a low priority given to dentistry, and a problem-orientated attitude towards seeking dental care.(8, 18) Perhaps the UHS dental service should look into ways of improving dental awareness among the eligible patients. This can be done through oral health campaigns to promote regular dental visits. For instance, educational posters on the importance of dental health and the treatments available for dental problems can be placed on notice boards in the university campus. The dental clinic staff can also hold lectures and seminars for both students and staff to promote dental health.

In summary, patients' overall satisfaction with the UHS dental clinic in 1996 and in 2000 under two different fee-paying systems was similar. Although the patients in 2000 were less satisfied with the cost of the dental service, they were more satisfied with the 'access', 'convenience' and the 'quality (interpersonal)' aspects of the service than the patients in 1996. It seems that a change from a time-based to an item-based fee-paying system which has resulted in a higher dental service output and a higher flexibility in arranging patient appointments can affect aspects of patient satisfaction other than cost.

It is recommended that the UHS should strengthen its oral health promotion activities to improve dental awareness among eligible patients. In addition, the UHS should hold patient group meetings to find out areas of weakness not identified in the DSQ. Thereafter, improvements can be made to the dental service accordingly. Last but not the least, the UHS, like any dental service provider, should continue to regularly conduct surveys on patient satisfaction in order to monitor and improve its dental service.

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Table 1. Abbreviated item content, direction of wording, and content category of the questionnaire used in the study.

Item	Abbreviated content	Direction of wording	Content category
1	Waiting area comfortable	+	Quality (Technical)
2	Dentists check everything	+	Quality (Technical)
3	Fees too high	-	Cost
4	Avoid dentist because of pain	-	Pain
5	Wait long time at dentist's office	-	Access
6	Dentists treat patients with respect	+	Quality (Interpersonal)
7	Enough dentists around here	+	Availability
8	Dentists should reduce pain	-	Pain
9	Dental clinic conveniently located	+	Convenience
10	Dentists avoid unnecessary expenses	+	Cost
11	Dentists not thorough	-	Quality (Technical)
12	See same dentist	+	Continuity
13	Hard to get appointment right away	-	Access
14	Dentists relieve most problems	+	Quality (Outcomes)
15	Convenient opening hours	+	Access
16	Dentists explain what they do and cost	+	Quality (Interpersonal)
17	Dentists keep people from dental problems	+	Quality (Prevention)
18	Dentists' offices modern	+	Quality (Technical)
19	Dentists not concerned about pain	+	Pain
20	Receptionists courteous and professional	+	Quality (Interpersonal)
21	Hygienists courteous and professional	+	Quality (Interpersonal)
22	Dental surgery assistants courteous and professional	+	Quality (Interpersonal)
23	Dental care could be better	-	General Satisfaction

Table 2. Number of respondents and UHS dental service users in the 2000 and 1996 surveys

Group	Sample size	Responded	Response rate (%)	No. of users	Utilization rate (%)
Students 2000	194	184	95	132	72
Students 1996	140	140	100	88	63
Staff and their spouses 2000	207	127	63	90	71
Staff and their spouses 1996	180	136	77	87	64

Table 3. Satisfaction of students using the University Health Service

Content category / Item/Abbreviated content	No. of items	Item-based service 2000 (N = 132)		Time-based service 1996 (N = 88)		Percentage change	Significance
		Mean (s.d.)	Prorated mean (s.d.)	Mean (s.d.)	Prorated mean (s.d.)		
Access	**3**		**64 (9)**		**54 (15)**	**19%**	**p<0.001**
5 Waiting time long at dental clinic		2.2 (0.8)		3.3 (1.1)		-33%	p<0.001
13 Hard to get appointment		4.2 (0.9)		1. 6 (0.9)		163%	p<0.001
15 Convenient opening hours		3.2 (1.0)		3.2 (1.0)		0%	N.S.
Availability/convenience	**2**		**66 (14)**		**59 (14)**	**12%**	**p<0.001**
7 Enough dentists in dental clinic		3.2 (0.9)		2.9 (0.8)		10%	p=0.003
9 Dental care conveniently located		3.4 (1.0)		3.1 (1.1)		10%	p=0.017
Cost	**2**		**50 (10)**		**62 (13)**	**-19%**	**p<0.001**
3 Fee too high		2.0 (0.6)		3.1 (1.1)		-35%	p<0.001
10 Dentists avoid unnecessary expenses		3.0 (0.7)		3.2 (0.8)		6%	p=0.049
Continuity	**1**		**66 (18)**		**70 (20)**	**-6%**	**N.S.**
12 See same dentist		3.3 (0.9)		3.5 (1.0)			
General satisfaction	**1**		**46 (12)**		**50 (18)**	**-8%**	**p=0.016**
23 Dental care could be better		2.3 (0.6)		2.5 (0.9)			
Pain management	**3**		**63 (11)**		**67 (12)**	**-6%**	**p=0.006**
4 Avoid dentists because of pain		4.1 (0.7)		3.5 (1.0)		17%	p<0.001
8 Dentists should reduce pain		2.4 (0.8)		3.3 (0.8)		-27%	p<0.001
19 Not concerned about pain		3.0 (1.1)		3.3 (1.1)		-9%	p=0.048
Quality-technical, prevention and outcome	**6**		**73 (8)**		**74 (7)**	**-1%**	**N.S.**
1 Waiting area comfortable		4.0 (0.6)		4.2 (0.6)		-5%	p=0.005
18 Dental clinic modern		3.6 (0.8)		3.8 (0.7)		-5%	p=0.039
2 Dentists check everything		3.6 (0.9)		3.8 (0.7)		-5%	p=0.035
11 Dentists not thorough		3.7 (0.6)		3.3 (0.8)		12%	p<0.001
14 Dentists relieve most problem		3.5 (0.9)		3.5 (0.8)		0%	N.S.
17 Dentists keep people from dental problems		3.4 (0.7)		3.5 (0.8)		3%	N.S.
Quality-interpersonal	**5**		**70 (12)**		**66 (12)**	**6%**	**p=0.014**
6 Dentists treat patient with respect		3.6 (0.7)		3.7 (0.8)		-3%	N.S.
16 Dentists explain what they do and cost		3.0 (1.1)		2.8 (1.0)		7%	N.S.
20 Receptionists' performance		3.4 (0.9)		2.7 (1.2)		25%	p<0.001
21 Hygienists performance		3.8 (0.8)		3.6 (1.0)		6%	N.S.
22 DSAs' performance		3.6 (0.8)		3.6 (1.0)		0%	N.S.
Dental Satisfaction Index (DSI)	**23**		**66 (6)**		**65 (7)**	**1%**	**N.S.**

Table 4. Satisfaction of staff and their spouses using the University Health Service

Content category / Item/Abbreviated content	No. of items	Item-based service 2000 (N = 90) Mean (s.d.)	Prorated mean (s.d.)	Time-based service 1996 (N = 87) Mean (s.d.)	Prorated mean (s.d.)	Percentage change	Significance
Access	3		65 (11)		58 (15)	**11%**	**p=0.001**
5 Waiting time long at dental clinic		2.1 (1.1)		3.6 (1.1)		-41%	p<0.001
13 Hard to get appointment		4.2 (0.7)		1.8 (1.1)		133%	p<0.001
15 Convenient opening hours		3.5 (1.1)		3.4 (1.1)		3%	N.S.
Availability/convenience	2		66 (16)		60 (17)	**10%**	**p=0.008**
7 Enough dentists in dental clinic		3.2 (0.8)		2.9 (1.0)		10%	p=0.035
9 Dental care conveniently located		3.4 (1.1)		3.0 (1.2)		13%	p=0.029
Cost	2		53 (16)		58 (17)	**-9%**	**N.S.**
3 Fee too high		2.1 (1.0)		2.5 (1.3)		-16%	p=0.014
10 Dentists avoid unnecessary expenses		3.3 (1.2)		3.3 (0.8)		0%	N.S.
Continuity	1		78 (28)		76 (16)	**3%**	**N.S.**
12 See same dentist		3.9 (1.4)		3.8 (0.8)			
General satisfaction	1		46 (24)		52 (22)	**-12%**	**p=0.034**
23 Dental care could be better		2.3 (1.2)		2.6 (1.1)			
Pain management	3		65 (15)		65 (13)	**1%**	**N.S.**
4 Avoid dentists because of pain		4.2 (0.9)		3.5 (1.2)		20%	p<0.001
8 Dentists should reduce pain		2.4 (1.4)		3.2 (1.0)		-25%	p<0.001
19 Not concerned about pain		3.1 (1.3)		3.0 (1.2)		3%	N.S.
Quality-technical, prevention and outcome	6		77 (9)		71 (9)	**8%**	**p<0.001**
1 Waiting area comfortable		4.2 (0.6)		4.0 (0.7)		5%	N.S.
18 Dental clinic modern		3.7 (0.9)		3.4 (0.9)		9%	p=0.017
2 Dentists check everything		4.0 (0.9)		3.8 (0.8)		5%	N.S.
11 Dentists not thorough		3.7 (0.8)		3.4 (0.9)		9%	p=0.003
14 Dentists relieve most problem		3.8 (0.8)		3.5 (0.9)		9%	p=0.014
17 Dentists keep people from dental problems		3.6 (1.0)		3.4 (0.9)		6%	N.S.
Quality-interpersonal	5		77 (13)		71 (14)	**8%**	**p=0.003**
6 Dentists treat patient with respect		4.0 (0.6)		3.8 (0.7)		3%	N.S.
16 Dentists explain what they do and cost		3.5 (1.0)		3.2 (1.2)		9%	N.S.
20 Receptionists' performance		3.7 (1.0)		3.2 (1.2)		16%	p=0.001
21 Hygienists performance		4.0 (0.8)		3.8 (3.8)		57%	N.S.
22 DSAs' performance		4.2 (0.9)		3.7 (0.9)		14%	p=0.002
Dental Satisfaction Index (DSI)	23		70 (9)		66 (8)	**6%**	**p=0.001**

Table 5. Reasons given by students for not using the UHS dental service (Multiple responses allowed)

Reasons	Item-Based Service 2000 (N = 52)		Time-Based Service 1996 (N = 52)		Significance
	Number	Percentage	Number	Percentage	
No perceived dental problem	20	38	17	33	NS
Busy/no time	20	38	22	43	NS
Long waiting time	15	29	30	58	p=0.005
Join other dental scheme	13	25	11	22	NS
Dental fear	8	15	9	17	NS
Seek private dentist	3	11	16	31	p=0.037
High fee	7	13	1	2	NS
Other reasons	1	2	6	12	NS

Table 6. Reasons given by staff and their spouses for not using the UHS dental service (Multiple responses allowed)

Reasons	Item-Based Service 2000 (N = 37)		Time-Based Service 1996 (N = 49)		Significance
	Number	Percentage	Number	Percentage	
No perceived dental problem	10	27	8	16	NS
Busy/no time	8	22	10	20	NS
High fee	8	22	19	39	NS
Join other dental scheme	7	19	13	27	NS
Long waiting time	5	14	29	59	p<0.001
Seek private dentist	5	14	13	27	NS
Dental fear	3	8	8	16	NS
Other reasons	1	3	4	8	NS