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Patient experiences during waiting time for dental treatment

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Abstract

Objectives. The aim of this study was to evaluate patient experiences of inconvenience and treatment need while waiting for dental treatment. ***Materials and methods.*** A systematic sample of 210 patients with varying lengths of waiting time was drawn from the waiting list for non-emergency treatment in the City of Turku. A questionnaire covering socio-demographic background was mailed to the patients. The level of inconvenience caused by waiting was assessed by a linear visual analogue scale (0–100). ***Results.*** A total of 112 subjects (60%) completed and returned the questionnaire and 109 (58%) gave permission to collect data from their patient records. The average inconvenience score was 42.9, with those who had waited for 3 months or less reporting less inconvenience than those that had waited for 4 months or more. There was not a straightforward linear correlation between length of waiting time and level of inconvenience experienced. Experiences of inconvenience were independent of socio-demographic background. The patient-reported maximum acceptable waiting time for non-urgent dental treatment was 45.8 days. Fewer than half (42.0%) of the subjects had received treatment while waiting for comprehensive care; women (51.7%) significantly ($p < 0.05$) more often than men (31.5%). Fillings and unspecified emergency treatments were the most commonly needed treatment. ***Conclusions.*** Waiting for dental treatment appears to be well-tolerated, as long as the waiting time remains reasonable. Treatment providers seem to have few means with which to rank dental patients into several queues with different urgencies.

Key Words: *access, health services research, outcome, provision*

Introduction

Waiting for non-urgent dental treatment seldom causes direct costs or economic losses to patients. Furthermore, delayed non-urgent dental care probably does not cause increased days of sick-leave or loss of productivity in the work-force. However, patients may feel annoyed and irritated if they have to wait for the treatment they have requested. In economics such negative factors, usually without any measurable price-label, are called intangible costs. People as consumers have so-called positive time preference, meaning that we appreciate receiving goods and services sooner instead of later. Thus, prolonged waiting time for dental treatment can be expected to include intangible costs to patients.

According to economic theory, longer waiting times could be offered to patients who do not place a high value on rapid treatment, as prolonged waiting time does not cause much trouble, inconvenience or other intangible costs to them, i.e. they have a low marginal cost for waiting time. Also patients who consider dental treatment to be a luxury item may be less annoyed by a long waiting time than those who consider it a necessity [1]. In several medical specialities, risk-based, urgency and other scoring systems have been suggested in order to rank patient cases into different queues [2–4].

Production and operations research theories which have been developed for so-called normal goods and markets are not necessarily applicable to healthcare and dentistry, where patient demand for appointments can be permanently greater than the capacity of providers to offer appointments [4,5]. This is often the case in dentistry, particularly if dental services are publicly funded or subsidized. Grytten and Sørensen [6] have shown that theories developed for a free market economy may not be directly applicable to dentistry.

Patient satisfaction has been considered one of the desirable outcomes of dental care [7] and should be

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an objective of healthcare providers and organizations [8]. However, waiting times have been reported to be one of the major reasons for dissatisfaction [9–12] and can reduce the use of dental [13] and medical services [14,15].

The City of Turku provides subsidized dental care for all permanent residents. However, demand exceeds available capacity and this is partly managed by purchasing additional services from private practice providers. Emergency treatment is provided immediately and semi-urgent treatment, within 3–6 weeks, but for other forms of treatment, excess demand exists and requires use of a waiting list.

The aim of this study was to evaluate patient experiences of inconvenience and treatment need while waiting for dental treatment.

Materials and methods

In the City of Turku, Finland, when a patient reserves an appointment for a check-up, he/she is placed at the end of a waiting list and people on the list are served on a first-come, first-serve basis. Sometimes patients have to wait up to 6 months before the required treatment can be provided. People on this waiting list formed the sampling base for this study.

A systematic sample was drawn from the waiting list for non-emergency dental treatment. At the time of sampling, ~3600 adult patients were listed. Lack of earlier data on expected values or their distributions did not allow formal estimation of the required sample size. Expert opinion of the Chief Dental Officer of the city was utilized. First, the 7th subject on the list was randomly drawn and thereafter every 17th subject was picked, producing a sample of 210 subjects. This sampling technique guaranteed that the sample was comprised of subjects with varying waiting times, as those at the beginning of the list had been waiting for a longer time than those recently placed on the list. Some of the sampled subjects did not have a valid mailing address (n = 18) and some were unable to read and write Finnish (n = 4), so they were omitted from the final sample, which was comprised of 188 subjects.

The ethical committee of the Hospital District of Southwest Finland and the City of Turku approved the study and the sampled subjects received a written description of the sampling, the purposes of the study and the planned use and storage of the information they were to provide. This was followed by a description of the subject's rights according to the Helsinki declaration. The participating subjects were asked to give their written informed consent and separate written permission to collect data from their patient records.

A questionnaire was sent, with the above-mentioned descriptions and permissions, together with a pre-paid return envelope. As a background variable gender was coded (0) female and (1) male. Age in years was used as such and also dichotomized as (0) less than 50 years, (1) 50 years and older and in three categories (0) less than 35 years, (1) 35–64 years, (2) 65 years and older. Level of income was determined by (a) monthly gross income, (b) monthly gross income in the household and (c) monthly gross income in the household divided by the number of members in the household. In the final analyses monthly gross income per person in the household was used. It was used as such and also dichotomized (0) 1000 euro or less, (1) more than 1000 euro and further as a three category grouping (0) 800 euro or less, (1) 801–1300 euro, (2) more than 1300 euro. Educational status was originally collected in five categories and later dichotomized as (0) primary education, (1) more than primary education. Dichotomies were formed for patients being in active workforce or not and retired or not. Regularity of dental check-ups during the last 10 years was solicited and two dichotomies were formed (0) not attending at least annually, (1) attending at least annually and (0) not attending at least every second year, (1) attending at least every second year. Both dichotomies were used in the final analyses. Possible inconvenience caused by waiting for comprehensive treatment was solicited by asking: 'Please mark an "X" on the line below to indicate how much inconvenience you have experienced from waiting your comprehensive dental treatment to begin?' This was followed by a 100-mm-long Visual Analogue Scale (VAS), with the extreme points labelled (0) None and (100) Extremely. This was followed by another assessment, asking: 'Please mark an "X" on the line below to indicate how much inconvenience you still expect to experience during the time you still expect to remain on the waiting list?' This was followed by a third VAS addressed to those patients who had needed acute dental treatment during the waiting time: 'In case you have needed to attend dental treatment during the waiting time, please mark an "X" on the line below to indicate how much inconvenience you have experienced from attending this treatment?' The used Finnish language expression 'haitta tai vaiva' best translates to inconvenience and covers a wide range of English language terms, like bother, trouble, annoyance, irritation, discomfort, nuisance, etc.

Patients were asked about the number of possible dental visits during the waiting and the sector (public/private) of the treatment provider. Those who had received dental treatment during the waiting time were given a pre-defined list of possible treatments from which to select: (a) emergency treatment, (b) filling, (c) extraction, (d) root canal, (e) periodontal, (f) denture repair and (g) other, please specify _____. These were later compared with the treatment registered by the treatment providers.

The subjects were asked to give their estimate for the maximum acceptable waiting time for non-urgent dental treatment.

Six months after the survey, when all the treatment episodes had been provided, data on the different types of visits and treatment procedures were collected and used to ascertain the validity of the patients' self-reported treatment.

Descriptive analysis was undertaken to describe inconvenience experienced by patients. The level of statistical significance was set at $p < 0.05$. Both parametric and non-parametric methods were applied. As mean and median values were practically the same, final statistical analyses of the data were based on Student's *t*-test for means and the chi-square test for proportions. Correlation coefficients were tested for associations between continuous variables. Generalized linear models were fitted to evaluate whether waiting time had an independent effect on the levels of inconvenience experienced overall and among men and women. Both fixed and stepwise linear regression models were employed to estimate the effects of background variables on the level of inconvenience using SPSS version 16.0 (SPSS Inc., Chicago, IL).

Results

Of 188 patients included in the study, 112 subjects returned completed questionnaires (60%) and permission to collect data from their patient records was given by 109 (58%). The age and sex distributions of the respondents were similar to those of all adult patients treated during the year. The average score for the inconvenience caused by waiting for comprehensive treatment was 42.9 (SD = 26.9), distributed relatively evenly though much inconvenience (score 80 or more) was proportionately less represented (Figure 1). None of the background variables were significantly associated with the perceived level of inconvenience in univariate (Table I) or in multivariate analyses. This was also observed when the continuous variables were used as such, in three categories or dichotomized.

Women experienced slightly more inconvenience (44.2, SD = 27.2) than men (41.0, SD = 26.7). Women also anticipated more inconvenience during the remaining waiting time (31.7, SD = 27.3) than men (28.4, SD = 24.5). The patient-reported maximum acceptable waiting time for non-urgent dental treatment was 45.8 days (SD = 43.3) for all patients, 48.4 (SD = 51.9) among women and 42.4 (SD = 27.6) among men. These differences between sexes were statistically non-significant, *p*-values ranging between 0.13–0.55.

Clear duality was observed when studying the effect of waiting time on the inconvenience experienced by patients. Those who had waited for up to 3 months experienced less inconvenience compared to those who had waited for 4 months or more. There was not a straightforward linear correlation between length of waiting time and level of inconvenience experienced (Figure 2). However, in a generalized linear model the difference between shorter and longer waiting times was statistically non-significant.

Those who perceived a higher level of inconvenience anticipated experiencing a higher level of inconvenience during the time they still expected to

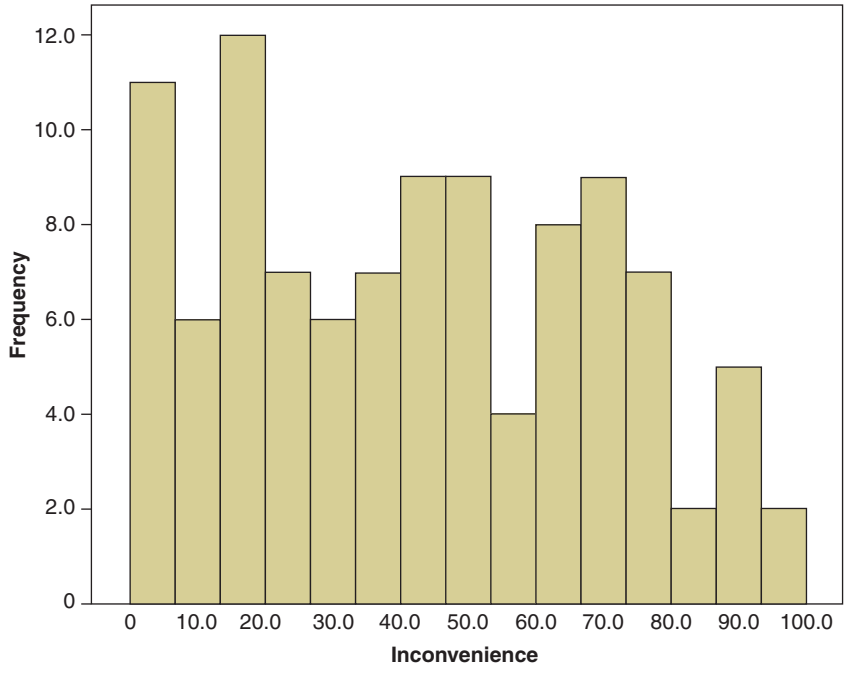

Figure 1. Frequency distribution of inconvenience experienced by patients waiting for comprehensive dental care.

Table I. The level of inconvenience experienced by patients according to dichotomized background factors (number of subjects in parentheses).

	Mean inconvenience level	*p*-value
Age		
less than 50 ($n = 61$)	39.0	
50 or more ($n = 43$)	48.6	0.07
Net monthly income per persons in the same household		
less than 1000 euro ($n = 62$)	42.8	
1000 euro or more ($n = 42$)	40.1	0.62
Sex		
women ($n = 61$)	44.3	
men ($n = 43$)	41.1	0.55
Education		
primary ($n = 72$)	43.1	
higher ($n = 32$)	42.5	0.92
Working status		
not working ($n = 33$)	47.4	
working ($n = 71$)	40.9	0.25
Retirement status		
not retired ($n = 82$)	43.1	
retired ($n = 22$)	42.2	0.89
Regularity of dental check-ups		
less often than annually ($n = 82$)	42.3	
at least annually ($n = 22$)	45.5	0.62
Regularity of dental check-ups		
less often than every second year ($n = 44$)	41.3	
at least every second year ($n = 60$)	44.2	0.58

Statistical comparisons by Student's *t*-test.

remain on the waiting list ($r = 0.758$, $p < 0.001$). This was more pronounced among women ($r = 0.817$, $p < 0.001$) than men ($r = 0.663$, $p < 0.001$); in the generalized linear model the difference between sexes was statistically highly significant ($p < 0.001$).

During the entire waiting time fewer than half (42.0%) of the subjects received some sort of treatment while waiting for comprehensive care; women (51.7%) significantly ($p < 0.05$) more often than men (31.5%). Treatment was sought from the private sector by 46% of patients and from the public sector by 54%. Those who needed such treatment had visited a dentist an average of 2.5 (SD = 2.2) times; women made 2.3 (SD = 2.3) visits and men made 2.8 (SD = 2.0) visits (NS). Fillings and unspecified emergency treatments, like temporary fillings, smoothening of sharp edges or pain relief were the most commonly needed treatment. Men needed extractions significantly more often than women (Table II). Those who needed treatment during the waiting time perceived a higher level of inconvenience (score 48.0, SD = 30.1) than those who did not need treatment (score 38.2, SD = 22.8). However, this difference was only close to statistical significance ($p = 0.06$). Patient reported numbers of visits for treatment and the types of treatment provided matched well with the actual records of dentists.

Discussion

The finding that a majority of the patients expressed a relatively low level of inconvenience because of waiting for dental treatment can be interpreted as the patients tolerating the waiting fairly well. Waiting for health services that are more fundamental for acceptable survival in everyday life, like cataract or hip and knee replacement surgery, could be expected to cause more inconvenience. The maximum acceptable waiting times for such surgery is similar to or even longer [14–17] than that expressed by dental patients in the present study. This discrepancy can be interpreted as an indication that dental services are relatively highly valued by patients. However, none of the studies on cataract or orthopaedic surgery covered patient's experiences or any measures of possible inconvenience which could be compared with our findings.

With regard to orthopaedic surgery, Löfvendahl et al. [18] did not find any significant effect of socio-economic background variables on the perception of waiting time. This is in line with our finding in dentistry that none of the background factors studied were significantly associated with the inconvenience experienced. The present study did not find any groups with significantly lower marginal cost of waiting time than other groups. Very few patients who initially chose the public service provided by the City later decided to seek comprehensive treatment from the private sector while waiting, suggesting that waiting time is not necessarily considered significant. The patients in this study presumably chose public service knowing that the out-of-pocket costs would be lower than if they had chosen to use private services. At the same time, they presumably accepted that this option includes intangible costs in the form of waiting time. These patients may have estimated that the saving in the direct treatment costs would be more valuable than the intangible cost of waiting. In economic terms, for them the opportunity cost of waiting was lower than the monetary contribution needed for private dentists' fees.

The City of Turku provides healthcare services for ~175 000 residents. Not all residents use publicly-funded dental services, many people go directly to the private sector for treatment. Public

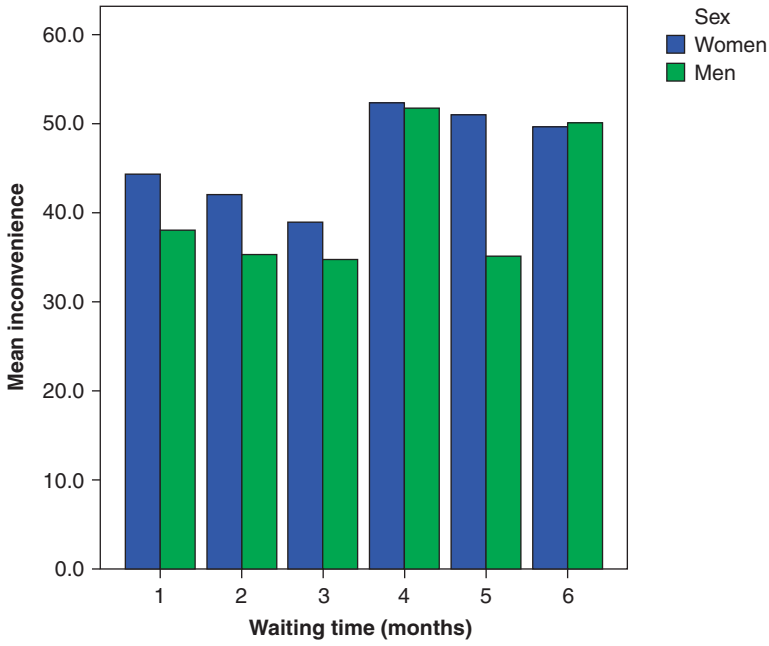

Figure 2. Average rating of inconvenience experienced by patients according to length of waiting time and gender.

dental care in the City of Turku is provided for just over 50 000 patients each year. The present study sample was comprised of people who had decided to use subsidized public dental services instead of using the private sector with more rapid access and free pricing. Thus, our findings should not be directly generalized to all consumers, but represent more the behaviour of those who are ready to accept some waiting time. The City authorities estimate that only a few percent of the patients on the waiting list search for treatment directly from the private sector and therefore drop out of the waiting list. However, ~10% of patients move elsewhere during the waiting time and become ineligible for subsidized treatment provided by the City and cause drop out, 8.6% in this study. It is assumed that the sampled patients are not otherwise selected and the sampling method ensured that patients with varying lengths of waiting time and varying dental treatment needs were included. The finding that the respondents had similar age and sex distributions to all patients supports the view that the sample was representative. It was not possible to study the characteristics of the non-respondents in more detail, as they had not given their written permission to use the information on their patient records.

Table II. Percentage distribution of subjects with reported types of dental treatment among those who had received any treatment during waiting time, by gender.

Treatment	Women	Men	All
Emergency	35.4	25.5	31.3
Fillings	60.1	47.1	56.0
Extractions	12.5	41.2	22.4*
Root canal	18.8	5.9	14.3
Periodontal	12.5	0.0	8.2
Denture repair	3.1	11.8	6.1
Other	3.1	17.7	8.1

Statistical comparison between sexes by Chi-square test: *$p < 0.05$.

The patient's expectations may have a strong influence on how they experience waiting time [19–21]. Informing patients during the waiting time has been suggested as a means to reduce perceived inconvenience [14]; unexplained waits can seem longer than explained waits. Our sample patients had not been provided with any information system that could give them estimates of how long they could expect to wait. Our finding of the dualistic nature of the inconvenience experienced by patients as they wait suggests that it might be useful to consider creating a system whereby patients receive information on waiting list development after a certain waiting time. In our sample, this might be ~3 months. This could decrease the inconvenience patients experience when having to continue waiting.

Shorter waiting times undoubtedly increase the proportion of satisfied consumers [9–12], as those who had experienced more inconvenience during their waiting time also expected to have more inconvenience during the forthcoming waiting time. Information on available services in case of an emergency or a semi-urgent case could be provided, as those who had needed acute treatment during the waiting time expressed more inconvenience than those who had

not needed such treatment. Although the difference between these two groups was only close to statistical significance, this may have been due to the relatively small sample sizes.

Ranking patients into different queues, as suggested for various medical specialities [2–4], would require a thorough oral health examination and professional assessment. This would require skilled professional resources, which would decrease the feasibility of such a practice. Emergency treatment is normally given priority. This, however, leads to allocation of scarce resources away from comprehensive dental care, which may further lengthen waiting times [22]. Grouping patients into different queues according to socio-demographic or geographic background would be a problematic method to apply, because the fairness and equity of such a practice could be questioned.

In conclusion, it appears that waiting for dental treatment is well-tolerated, as long as the waiting time remains reasonable. Treatment providers seem to have few means with which to rank dental patients into several queues with different urgencies.

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