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Patient characteristics in relation to dental care payment model: capitation vs fee for service

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Objective: To analyse patient profiles in two payment models, the capitation (DCH) and the fee-for-service (FFS) systems, in relation to socioeconomic status, self-reported health and health behavior, as well as patient attitudes to and satisfaction with the DCH model in the Public Dental Service (PDS) in Sweden. ***Research design and participants:*** The present survey included a random national sample of the adult population in Sweden. A telemarketing company, TNS SIFO, was responsible for the sample selection and telephone interviews conducted in May 2013. The 3,500 adults (aged ≥19 years) included in the sample gave a participation rate of 49.7%. ***Results:*** Individuals choosing DCH were younger. FFS patients rated their health as less good, were less physically active, were more often smokers and had a lower household income. The DCH patients were more satisfied with their payment model than the FFS patients (98% vs 85%). A multivariate analysis showed that three of the variables significantly contributed to the model predicting DCH patients: age, with an odds ratio of 0.95, household income (OR=1.85) and importance of oral health for well-being (OR=2.05). ***Conclusions:*** There was a pattern of dimensions indicating the choice of payment model among adult patients in the Swedish Public Dental Service. The patients in DCH had higher socioeconomic position, were younger, rated their oral health as better and were more satisfied with the payment model (DCH) than the patients in the FFS system.

Key words: *capitation, socio-economic status, health behavior, epidemiology, Sweden*

Introduction

Dental care in Sweden is financed through a national dental insurance scheme, irrespective of whether the provider is private or public. Thus, adult patients pay all fees up to €320 (SEK 3,000) for performed dental treatment, half the cost between €320 and €1,600 and 15% of the cost above €1,600 in the fee-for-service system. Moreover, children and young adults (≤19 yrs.) are included in the national dental insurance and dental care is free of charge. However, in 2009, the Public Dental Service (PDS) organizations in all county councils/regions in Sweden decided to change the dental care financing system for adults by introducing a new dental insurance scheme, a capitation dental plan for adult patients above 19 years of age (named "Frisktandvård" in Swedish, Dental Care for Health, DCH, translated into English by the PDS). The traditional fee-for-service system for adults is now optional, as a parallel system. Thus, after receiving information about the systems, the adult patient may now decide which dental plan he or she believes will be the optimum choice. Such a large-scale change to a new financing system is implemented with the objective of achieving the maximum societal benefit from the resources that individuals and society choose to use for dental care (Andrén Andås, 2015; Grönqvist, 2004; Zickert *et al*., 2001). Is capitation such a system? Few scientific publications are found in this area of research concerning adults (Johansson *et al.*, 2007a; Widström and Eaton, 2004), but several studies have evaluated payment systems in pediatric dentistry (Beazoglou *et al.*, 1988; Lennon *et al.*, 1990; Mellor *et al.*, 1997). Now, after a few years with this nationally implemented payment model for dental care, it will be possible to study different aspects and effects of this alternative dental financing system and to compare it with the traditional fee-for-service system.

The capitation system means that the adult individual (>19 years of age) enters into a three-year contract with a dentist and dental hygienist at a PDS clinic. The dentist estimates what amount of dental care a patient may need during the period and the risk classification will, in turn, include a suggested allocation to a premium category. The patient will then decide whether or not to accept the monthly payment determined in this way. There are ten premium categories, determined through the risk classification for each individual, which are based on a system that includes assessments of the technical risk, previous disease activity (periodontitis, caries) and anamnestic information (lifestyle, health behavior). The patients will get any dental treatment that may be needed, regardless of the cost. However, specialized dental care is not included. In addition, an individually designed self-care protocol for the patient is included in the contract. The monthly premium varies between €5 and €95 and the three-year contract period may be extended after a renewed risk assessment. The choice between the new dental insurance and the traditional fee-for-service system is entirely up to the patient.

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However, the scientific literature has few reports on who decides to opt for the new system and who decides to remain in the traditional system. In a prospective study in a region in Sweden, the authors found a certain pattern for the patients' choice of payment model (Andrén Andås and Hakeberg, 2014). The results revealed that females with higher education reporting better oral health were more likely to choose the new dental insurance model. At the time of that study, the new payment model had recently been implemented in the region, whereas national data are still lacking. Other research points in the same direction; for example, the study by Johansson *et al.* (2007b; 2010), revealed a similar pattern regarding which individuals choose a capitation system. Some changes to the terms and conditions of the capitation system in Sweden have been included since the described studies were performed and other risk factors, such as lifestyle indicators, other SES variables (household income, economic resources) and self-rated health (oral and general), also need to be analysed. Depending on the results of the analysis and assuming that the DCH system is based on the principles of equity and transparency, the observations may be used to change the information and the terms and conditions to ensure better accessibility and comprehensibility of the DCH system.

The aim of this study was to analyse patient profiles in the DCH versus the FFS systems in relation to socioeconomic status, self-reported health and health behavior, using a national random sample of adults. A second aim was to explore the DCH patients' attitudes to and views on the DCH.

Methods

Data were collected from a random national sample of Swedish adults by TNS SIFO, a Swedish company that performs public opinion and market surveys. TNS SIFO was responsible for the sample selection and the survey's telephone interviews. The participants were randomized from the Swedish Personal Address Register (SPAR) which includes all registered Swedish residents. The exclusion criterion was those not speaking and/or understanding Swedish. The 3,500 adults (aged ≥19 yrs) included in the sample gave a participation rate of 49.7%.

A questionnaire with items concerning demography, socioeconomic situation, dental care payment model, self-rated health, dental care behavior, attitudes to dental care and lifestyle issues, was used in the study (Table 1). There were 38 questions; however, the questions pertaining to the choice of payment model were the focus of this analysis.

The following variables were used in the analysis:

1. choice of dental plan within the PDS;
2. demographic variables, such as gender, civil status (married/living together vs. single), income in '000 SEK (<200, 201-400, 401-600, ≥601 where SEK 9≈1 €) for the whole household, level of education (primary school, high school, university, Masters or PhD degree), estimated economic resources for unforeseen expenditure (SEK 15,000 in a week, four response alternatives: yes, always; yes, mostly; no, mostly not; no, never);

Table 1. Distributions of the responses for the respective payment model, DCH and FFS presented as mean (standard deviation) and proportions. Test of statistical significance between DCH and FFS.

Category	*Independent variables*	*DCH*	*FFS*	*Total*	*p value*
Age		38.8 (13.3)	50.3 (7.9)		<0.001
Gender	Women	55.4%	51.6%	52.4%	0.231
	Men	44.6%	48.4%	47.6%	
Civil status	Married	76.0%	69.4%	70.7%	0.022
	Single	24.0%	30.6%	29.3%	
Household income	>400,000 SEK	65.2%	49.8%	52.8%	<0.001
	≤400,000 SEK	34.8%	50.2%	47.2%	
Economic resources, SEK 15,000 in a week	Yes, always	47.9%	50.6%	50.0%	0.411
	Mostly/mostly not	52.1%	49.4%	50.0%	
Education	University	44.3%	39.4%	40.4%	0.123
	High school or less	55.7%	60.6%	59.6%	
Oral health	Good	82.4%	68.4%	71.2%	<0.001
	Poor	17.6%	31.6%	28.8%	
Importance of oral health for well-being	Very important	72.0%	58.7%	61.4%	<0.001
	None/less important	28.0%	41.3%	38.6%	
Satisfaction with tooth appearance	Satisfied	93.0%	87.6%	88.6%	0.005
	Not satisfied	7.0%	12.4%	11.4%	
General health	Good	92.7%	84.4%	86.0%	<0.001
	Poor	7.3%	15.6%	14.0%	
Physical activity	≥once a week	84.3%	74.1%	76.2%	<0.001
	<once a week	15.7%	25.9%	23.8%	
Smoking	No	71.0%	58.9%	61.3%	
	Previous	22.6%	29.9%	28.5%	<0.001
	Yes	6.4%	11.2%	10.2%	

3. self-perceived health and lifestyle variables: How good is your general health? (five response options: poor, bad, fair, good, excellent); How good is your oral health? (four response alternatives: poor, fair, good, very good); How important is your oral health for your well-being? (four response alternatives: not important, somewhat important, important, very important); Are you satisfied with the appearance of your teeth? (four response alternatives: very dissatisfied, dissatisfied, satisfied, very satisfied); How much do you exercise during your leisure time? (five response alternatives: no exercise, a little, once a week, twice a week or more, intensive exercise at least twice a week), smoking (yes, previous smoker, no), and finally,
4. five questions about attitudes and beliefs about the DCH payment model, specifically about the choice of DCH, the agreement/contract, the monthly premium, delivery of dental care and satisfaction with the payment model. Each question was measured with four response alternatives (not at all, a little, rather, very much). The last question was also asked of the patients in the FFS group.

The analysis included frequencies, measures of central tendency (means and medians) and variability (standard deviation and quartiles). Bivariate analyses were performed using the t test, the Mann-Whitney and correlation tests (Pearson and Spearman). Multivariate logistic analysis was used with the payment model (0=FFS vs 1=DCH) as the dependent variable. A model evaluation was performed using the Hosmer-Lemeshow and Nagelkerke test statistics. The pre-selected level of significance was α=0.05. Most of the variables were reclassified into dichotomous or trichotomous categories, because of the small numbers in some of the original categories. Due to some missing responses, the numbers of observations differ in the analysis. When multiple comparisons were performed, Bonferroni corrections were applied.

Results

Out of 3,500 participants, 1,591 (45.4%) used the PDS for their dental care. Over 54% stated that they received their dental care in private clinics. Among those in the PDS, 314 (19.7%) had chosen DCH; however, it was not possible to retrieve their time of entry in the DCH; hence, individual experiences of DCH in relation to the length of the contract time are unknown in this cross-sectional survey.

Table 1 shows the independent variables and the distribution of responses per payment model, the DCH and the FFS, respectively. After correction for multiple comparisons, the following independent variables were significant with respect to the payment model: age, household income, oral health, importance of oral health for well-being, general health, physical activity and smoking. Individuals choosing DCH were younger. Regarding the remaining significant variables, FFS patients rated their health as less good, had less physical activity, were more often smokers and had a lower household income. However, the differences were not substantial with regard to the proportions in the two payment systems. The two questions about economic status revealed that more DCH than FFS patients reported a high household income (65.2% vs. 49.8%) though their economic resources were similar (47.9% vs. 50.6%).

The participants who had a DCH contract were asked to answer questions pertaining to the importance of certain features of the DCH model, such as the agreement between the patient and caregiver, the importance of the monthly payment scheme and the possibility of receiving dental care when needed, at their ordinary clinic or at any PDS clinic nationally. Table 2 shows the outcome of these three questions, where the participants rated all three issues as "very much" or "rather much"; from 82% up to 99%. Women rated these factors as more important than did men. Table 3 shows the proportion of individuals who were very satisfied with their payment model, the DCH or the FFS. The results indicate a clear difference between the payment models, inasmuch as the DCH patients were "very satisfied" or "rather satisfied" with their model to a higher degree (DCH, 98% vs FFS, 85%, p<0.001).

Table 2. Percentage distribution of responses to specific questions concerning importance of aspects of the capitation dental plan (DCH) by gender and overall

Importance of...	*Women*	*Men*	*All*	*p*
Patient-Caregiver agreement	n=172	n=137		0.014
Very much	51	33	43	
Rather	36	46	41	
A little	11	18	14	
Not at all	2	4	3	
Monthly payments	n=172	n=137		0.017
Very much	45	30	38	
Rather	43	46	44	
A little	8	15	11	
Not at all	5	9	7	
Dental care when needed	n=177	n=122		0.006
Very much	96	85	91	
Rather	4	14	9	
A little	1	0	0	
Not at all	0	1	0	

Table 3. Patient satisfaction with the respective payment models, capitation dental plan (DCH) and fee-for-service (FFS) presented as number and percentage

Satisfaction with payment model	*DCH*		*FFS*	
	n	*(%)*	*n*	*(%)*
Very satisfied	171	(58)	296	(25)
Rather satisfied	117	(40)	695	(60)
Very/rather dissatisfied	6	(2)	175	(15)
Total	294	(100)	1,166	(100)

A multivariate logistic model was applied, using the payment system as the dependent variable and including the statistically significant variables from the bivariate analysis as independent variables (Table 4). The model indicates that three of the variables significantly contributed to the model predicting DCH patients: age, with an odds ratio of 0.95, household income (OR=1.85) and the importance of oral health for well-being (OR=2.05). The model predicted approximately 80% of the outcome and accounted for 17% of the variability.

Table 4. Multivariate logistic model with the dependent variable payment system (Fee-for-service, FFS=0, n=1,194; Capitation dental plan, DCH=1; n=271) and the independent variables significant in the bivariate analysis

Independent variables		*B*	*SE*	*OR*	*95% CI*	*p value*
Age		-0.047	0.006	0.95	0.94, 0.96	<0.001
Household income,	ref: ≤400,000 SEK (≈€44,000)					
>400,000 SEK		0.614	0.154	1.85	1.37, 2.50	<0.001
Oral health,	ref: Poor					
Good		0.276	0.184	1.32	0.92, 1.89	0.13
Importance of oral health for well-being						
Very important,	ref: None/Less important	0.719	0.161	2.05	1.50, 2.81	<0.001
General health,	ref: Poor					
Good		-0.012	0.281	0.99	0.57, 1.71	0.97
Physical activity,	ref: <once a week					
≥once a week		0.303	0.194	1.35	0.93, 1.98	0.12
Smoking,	ref: Yes					
No		0.444	0.294	1.56	0.88, 2.77	0.13
Previous		0.315	0.316	1.37	0.74, 2.55	0.32

Discussion

This cross-sectional survey of a national random sample of Swedish adults shows dental care choice in relation to socioeconomic position, self-rated health and lifestyle, specifically with regard to the payment systems in dentistry in the Public Dental Service in Sweden, by comparing a new capitation model (DCH) to a traditional fee-for-service system (FFS). The results indicate that almost 20% of the adult patients within the PDS had chosen DCH. The DCH patients rated certain features of the DCH as being very important, such as the agreement/contract, regularity of payment and a guarantee of receiving dental care when needed. Moreover, the DCH patients were highly satisfied with the present payment model, significantly more so than the FFS patients. Two factors, in particular, were strong predictors of individuals choosing the DCH: household income and importance of oral health for well-being, with ORs of 1.85 and 2.05, respectively.

The present study revealed some obvious characteristics in those patients who had chosen DCH. Age, income, oral health factors, general health and lifestyle were the important variables in the bivariate analyses. Specifically, DCH-patients were found to be younger, to have higher income and to report good oral health and viewing oral health as important. Good general health and a healthy lifestyle with more physical activity and no smoking were also more important to those who had chosen DCH. Taken together, these findings form a pattern that is parallel to that seen in other publications (Andrén Andås and Hakeberg, 2014; Johansson *et al.*, 2007b; Zickert *et al.*, 2000). However, when all the significant factors in the bivariate analyses were taken into account, only three of them were statistically significant in the multivariate model. Age (younger), higher income and viewing oral health as important for well-being were the significant predictors of the DCH choice. The new and interesting finding is the last variable, which may capture the individual's sense of own oral health (as being good), but also a psychosocial aspect of how oral health impacts people's everyday life situations. This variable may be looked upon as a global indicator of Oral Health-Related Quality of Life (OHRQL). However, this variable is not a direct parallel to the established measures of OHRQL or self-reported oral health, but may still capture important aspects of different domains of these dimensions. The results point in this direction, as there was a strong association between good self-reported oral health and importance of oral health for well-being (data not shown). Moreover, the majority of respondents reported good oral health and high satisfaction with the appearance of their teeth, with a significantly larger proportion in the DCH group. This result further illustrates the awareness among patients of the importance of oral health and regular dental care. This is in line with other findings with regard to DCH, such as those of Johansson *et al.* (2007b).

The study also measured the DCH patients' attitudes and satisfaction with their dental care at the PDS clinics. The results were clear; most patients were "very satisfied" with the payment system and the content of the DCH model, with the agreement, the regular premium payments to enable better planning of the household economy and the feeling of guaranteed dental care whenever and wherever in Sweden, since the DCH is a national system across all PDS clinics. The degree of satisfaction with the DCH was greater than with the traditional FFS system, especially among those who were "very satisfied", 58.2% vs 25.4%. When taking into account patients who were "rather satisfied" with their payment model, the figures amounted to 98% and 85% for the two systems, respectively. The FFS result is in accordance with other reports; for example, in the study by Ekbäck *et al.* (2016), 83% of the patients were satisfied with their dental care in Sweden. That study analyzed a cohort born in 1942 and measured longitudinally their satisfaction with their dental care, both in the PDS and in private practices, over a period of 20 years. The results indicate that the proportion of individuals being satisfied with their dental care has been stable over time. In a study of a pilot version of today's DCH, Zickert *et al.* (2000)

reported that out of 907 patients in the capitation plan, about 98% preferred the DCH to the FFS system. In a review of the impact of financial systems on dental care and patient attitudes to the capitation and fee-for-service systems, Johansson *et al*. (2007a) concluded that there is little research into the satisfaction of adult patients with the capitation system. Thus, the results from the present study emphasize patient satisfaction with the new payment model, including the agreement between the patients and the caregivers concerning preventive actions on behalf of the respective parties. The question of confirmation bias, the well-known tendency to select arguments confirming already existing opinions, could be considered regarding the positive ratings of the DCH. Subjects who had chosen the DCH could be biased to report attitudes confirming the correctness of their choice. On the other hand, the same bias could apply to subjects in the FFS system, although perhaps to a lesser degree as FFS could be regarded as the default condition. The interpretation of this study should be that health policy actors must recognize the positive aspects of DCH when further developing services within dental health care in Sweden.

Another perspective may be health promotion and preventive action at a more structural level (Sheiham and Watt, 2000). One could argue that the new system opens up for individual as well as population effects, as each patient receives advice about preventive self-action measures. However, given that the system is nationwide and includes all PDS clinics, the DCH is likely to influence a large proportion of adults in Sweden - not only the most advantaged groups of people - and thus act at a more upstream level.

Conclusion

There was a pattern of variables indicating the choice of payment model among adult patients in the Public Dental Service in Sweden. The patients in the DCH had higher socioeconomic position, were younger, rated their oral health as important for their well-being and were more satisfied with their choice of payment system than patients in the FFS system.

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