

Influence of dentist-related factors on the time spent in providing prosthodontic services among general dentists

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سحلت الدراسات اختلافات كبيرة في درجة الخدمة بين أطباء الأسنان وكذلك عبر المناطق . ومن ضمن المصادر العديدة للمرضى مثل هذه التبدلات هو أسلوب الممارسة وطريقة طبيب الأسنان ، والتي يمكن أن تؤثر على خطة العلاج . وبافتراض التعقيدات المتوارثة ، فإن تدبير خدمات التعويضات وبصورة خاصة عرضة للتبدلات . استخدمت هذه الدراسة طريقة الاستبيان للحصول على عدد من الحقائق المتعلقة بطبيب الأسنان وتنضم التوزيع السكاني والمستوى الاجتماعي وحالة العمل وأساليبه ، وسلوك طبيب الأسنان والذي يمكن أن يكون له تأثير على زمن الاستطلاع المصروف على زمن العلاج بالنسبة للتعويضات النسبة بين أطباء الأسنان الممارسين في الرياض ، المملكة العربية السعودية . الإستجابة لقائمة فيها ١٣ بدأتم الحصول عليها باستعمال مقياس مناظر مرئي (VAS) وتم تحليلها باستعمال مقياس التحليل . أربعة أبعاد للسلوك مع توضيح للتوقعات تم الحصول على ٥٢٪ من هذه الأربعة عوامل إضافة إلى تسعة متغيرات تعود إلى التوزيع السكاني والعوامل الاجتماعية وشكل الممارسة تم وضعها كاختلافات مستقلة بمجموعة متعددة التدرج . المتغيرات المستقلة كانت التقارير الأسبوعية الموجهة إلى العلاجات التعويضية .

الاقتران الواضح مع ازدياد ساعات التعويضات هو الساعات المصروفة أسبوعياً في علاج المرضى البالغين ، الجنسية ، قطاع العمل ، والاتجاه الرابع يتضمن السلوكية والنواحي الفنية . في الدليل المعتمد على الجنس ، المتلازمة الوحيدة الإضافية الواضحة هي الدليل المذكور . كانت عدد ساعات العمل الأسبوعي . النتيجة تقترح هذه العوامل ، غير التي عادة تعتبر كدليل تقليدي هام والتي تفرص صنع القرار ، مهمة في الوقت المأخوذ من قبل خدمة التعويضات من قبل طبيب الأسنان العام .

Studies have documented wide variations in the types and volumes of dental services provided by dentists. Such variations in service rates have also been observed across different regions. Besides the numerous patient-related sources of variation, dentist-related factors such as practice patterns and the beliefs and attitudes of dentists, can also affect treatment decisions, and thus service rates. Given its inherent complexity, the provision of prosthodontic services is especially prone to variation. This study used a questionnaire technique to evaluate the dentist-related factors, including social, demographic, work situation and patterns, and prevailing attitudes that may be influential in the reported time spent on prosthodontic treatment among general dentists in Riyadh. Responses to a list of 13 attitude items were analysed using factor analysis, which allowed a reduction of the items to 4 attitudinal factors with a variance explanation of 52%. These 4 variables, together with 9 other variables pertaining to socio-demographic and practice profile aspects, were then set as the independent variables in multiple regression models. The dependent variable was the reported weekly time spent on prosthodontic treatment of patients. Significant associations with increased prosthodontic hours were weekly hours spent on treating adults, nationality, working sector and one of the attitudinal factors which encompassed technical aspects. In the gender-based regression models, the one additional significant correlate for males was total weekly working hours. The results suggest that factors other than patient-related ones are also important in the time that general dentists allocate to the provision of prosthodontic services.

Introduction

Service rate is a term used to describe the types and volumes of treatment provided.¹ Wide variations in service rates across general dental practices are known to exist.^{2,3} Many factors can potentially influence a dentist's decision to undertake treatment, and thereby the service rate. A patient's dental status and demand for treatment are important factors for determining the need for treatment, as are any regulatory and financial aspects of the given dental health care system.⁴⁻⁶ Although less is known about the role of dentist-related factors in the decision-making process, differences in dentists' perceptions of disease patterns, differences in their educational background, or differing cultural values relating to health and health care, could also be influential.

Findings in medicine suggest that a high level of professional uncertainty increases the probability of a service being rendered which is more closely related to the style of practice of the provider than to the nature and severity of the illness.⁷ Even when professional agreement is high, other professional concerns, such as fear of malpractice and financial self-interest, can still introduce variation into treatment decisions.¹ However, the fact that variation exists does not imply that treatment is necessarily inconsistent with patient needs. It remains unsubstantiated whether lower levels of service utilization represent a more desirable level of care, or conversely, whether high service rates represent over-treatment.⁸ Nevertheless, clinical decision-making can affect the effectiveness and efficiency of care, which patients and insurers of health care

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are increasingly demanding.⁹

In dentistry, studies have shown that dentists' practice beliefs and certain characteristics of the practice are sources of variation in the rates of services provided.^{3,10} Thus, factors other than disease status alone, act to influence treatment strategy. For example, the pattern of decision-making of the provider may be a source of variation in service rates, as well as in the types of specific services so provided.

Prosthodontic services are a case in point, since it has been reported that, among general dentists, some provide much more such services than others.^{10,12} About 20% of the variation in prosthodontic service rates has been explained on the basis of dentist-related factors, such as gender and time in the profession.¹⁰ More recently, additional factors such as weekly hours spent on the dental care of adults, and working sector have been found to be strongly associated with time spent on prosthodontic services.¹²

In Saudi Arabia, a country undergoing rapid expansion in dental health care services, the provision of prosthodontic services is apparently also widespread, but, amongst general dentists, probably quite varied in both its volume and its nature. Little is known about the extent of such variations. Given the relative importance of dentist-related factors to the decision-making process that has been shown in studies conducted elsewhere,^{1,10,12} it is reasonable to suppose that local conditions and traditions might impact on the practice profiles and attitudes of individual providers. In order to explore this question, and to be able to test the assertion that regional differences exist, a study of prosthodontic decision-making among general dentists in Riyadh, Saudi Arabia, was initiated. The general intention was to gain an understanding of the variation to which the decision-making process is subject, and how this may relate to the extent of a dentist's involvement in prosthodontic services.

The present aim was to evaluate, using multivariate methods, the associations between the reported time engaged in prosthodontic services by general dentists, and a number of dentist-related factors, viz. social and demographic attributes, work conditions, and dentists' attitudes.

Materials and Methods

Study Population

The study population comprised general

dentists working in the greater Riyadh area. Due to unavailability of an accurate list of all dentists working in the area, random sampling was not feasible. Thus, convenience sampling was applied, but with an attempt made at purposive selection so as to represent relevant sub-groups of the total dental workforce. This was done by including adequate numbers of dentists, in the first instance from the different working sectors, viz. government (GS) and private sectors (PS), and secondly from across the different districts of the city. For the government sector, the dental departments of the large tertiary care hospitals (usually administered by specific government departments), the two dental colleges, and smaller dental clinics administered by the Ministry of Health, were included. While a dentist register was not available, a list of all private sector registered clinics was obtainable from the regulatory authority. Inclusion of clinics, and thus dentists, from the private sector was aimed at gaining broad coverage of the city's various districts.

A total of 228 dentists were surveyed, and 137 returned questionnaires were completed to the required level, yielding a response rate of 60%. Failure among respondents to answer single questions, namely internal non-response, was negligible. There was no available information for analysis of non-respondents.

Questionnaire

The questionnaire used was adapted from one used in a national survey of prosthodontic decision-making among Swedish general dentists,¹³ but took into account issues considered relevant to the local situation. The questionnaire comprised three parts:

The first part included questions regarding social and demographic attributes, such as gender, age, nationality, and working sector, and was preceded by a brief description of the intentions and scope of the research, as well as its confidentiality.

The second part comprised the following:

- (a) Aspects of work pattern were assessed by 3 questions enquiring about the number of weekly working hours devoted to treating all patients, to treating adult patients, and to providing prosthodontic treatment (this last question would subsequently be set as the

dependent variable in a regression model for data analysis). Interval scales were used (Table 1).

Table 1. Percentage distribution of weekly working hours (total, adults only, and prosthodontics), demand for services, characteristics of patients, and satisfaction as a dentist with respect to gender and working sector.

Variable	Total n=137	Males n=65	Females n=72	PS n=67	GS n=70
Weekly total clinical working hours					
<15 h		0	1	2	
15-20 h	1	5	1	5	0
21-25 h	3	6	1	2	1
26-30 h	3	15	10	8	4
31-35 h	12	9	26	8	17
36-40 h	18	19	17	15	29
41-45 h	18	18	14	14	19
>45 h	17	28	30	46	19
Weekly adult treatment hours	28				11
<15 h		8	7	12	
15-20 h	7	22	14	10	3
21-25 h	18	6	14	6	24
26-30 h	10	17	25	10	14
31-35 h	21	6	15	12	31
36-40 h	11	29	20	35	10
>40 h	24	12	5	15	14
Weekly prosthodontic treatment hours	9				4
<5 h		11	26	12	
5-10 h	19	49	47	48	26
11-15 h	48	17	15	18	49
>15 h	16	23	12	22	14
Level of demand for services	17				11
Large number of patients		43	44	36	
Average number of patients	44				51
Lack of patients	54	54	57	63	47
Characteristics of patients	2	3	0	1	2
Highly demanding, high expectations		17	12	13	
Acceptable demand, realistic expectations	15	74	78	81	16
Undemanding, low expectations	76	9	10	6	71
Satisfaction with work as a dentist	9				13
Satisfied		74	74	81	
Neither satisfied, nor dissatisfied	74	18	23	18	67
Dissatisfied	21	8	3	1	24

PS = private sector; GS = government sector

(b) Aspects of work situation were assessed by 3 questions enquiring about dentists' perceptions of demand for services in their practices, of the characteristics of their patients, and their satisfaction with working

as a dentist. A Likert scale with 3 categories was used for each question (Table 1).

(c) Thirteen items assessing dentists' attitudes are listed in Table 2. Statements were preceded by a written orientation to the exercise, and reassurance that there were no right or wrong answers, with the only objective being to record the respondent's spontaneous reaction. This was interpreted as reflecting prevailing attitudes among dentists. All statements had visual analogue scale (VAS) response alternatives coded in 8 equidistant steps, ranging from 1 = disagree completely to 8 = agree completely. This meant that negatively formulated statements indicated a strongly positive attitude when a low number was recorded. A case in point is item 3, Patients with poor ability to pay do not need information regarding the most expensive treatments, which had a mean of VAS score of 3.9. This means that the majority of dentists disagreed with the statement, and thus were favourably inclined towards giving patients information. The 13 items listed in Table 2 would subsequently be subjected to factor analysis (see Statistical methods below).

The third part of the questionnaire containing four hypothetical prosthodontic clinical scenarios, and a series of associated questions relating to clinical decision-making for the given cases is not presently reported.

Questionnaires were distributed to the selected dentists on an individual and personal basis, at a pre-arranged time as agreed to through prior telephone contact. A verbal explanation of the central purpose of the study, as well as clarification of certain key aspects of the methods used, for example the VAS, was given to each participant. A request for the earliest possible response was made. A telephone reminder was given three days after distribution, and the questionnaires were collected a week later.

Statistical Methods

Data were first analysed in frequency tables. Means, standard deviations and coefficients of variation (CV) were calculated and differences in means evaluated with the t test for gender and working sector.

Table 2. Means and standard deviations of responses to attitude items and differences between means with respect to gender and working sector (a negative difference indicates a greater female or GS mean)

Statement	Mean	SD	Mean difference (M/F)	P	Mean difference (PS/GS)	P
1. The patient must have good oral hygiene before any crown treatment can be considered	7.5	1.1	0.0	0.837	0.0	0.845
2. The implant option should always be given to the patient even if a conventional approach is possible	5.5	2.3	0.1	0.805	-0.6	0.128
3. Patients with poor ability to pay do not need information regarding the most expensive treatments	3.9	2.5	0.2	0.576	0.4	0.288
4. Age is of no concern when considering implant treatment for the edentulous patient	3.3	2.5	1.4	0.001	0.2	0.703
5. Only the dentist should carry out yearly check-ups	6.1	2.1	0.6	0.109	0.6	0.099
6. When a patient chooses between different treatments, the dentist should encourage the patient to decide on his/her own.	5.5	2.4	0.4	0.328	-0.8	0.050
7. Impression making should normally be delegated to auxiliaries	3.5	2.4	0.9	0.032	0.2	0.682
8. If you feel another dentist has provided inferior treatment for a patient, the patient should be advised to return to that dentist for re-treatment at no cost	5.4	2.5	0.2	0.623	-0.5	0.292
9. Close cooperation between dentists helps them to offer the best treatments possible to their patients	7.4	1.1	0.0	0.995	-0.1	0.780
10. The dentist should perform all stages of treatment to make the patient feel safe	6.1	2.0	-0.4	0.212	0.5	0.159
11. Failure of prosthodontic therapy is generally the result of the patient's neglect	3.8	1.9	0.3	0.359	-0.7	0.040
12. Missing posterior teeth should generally be replaced	5.7	2.3	0.8	0.053	1.5	0.000
13. Prior to prosthodontic treatment in the patient with a history of caries, dietary counselling is advisable.	5.4	2.1	0.3	0.380	-0.8	0.020

PS = private sector; GS = government sector

Responses to the attitude items from sub-section (c) of the second part of the questionnaire (Table 2) were analysed by factor analysis using principal components, a standard psychometric method to assess common variation between attitude questions.¹⁴ The number of principal components, or factors, were determined after inspection of scree plots and by applying the Kaiser criteria. For exclusion of items, communality was set at < 0.3. The factors were rotated by the Varimax method to maximize the total variance explanation retaining the dimensionality of factors. The loadings of items in each factor were resolved into additive indices transformed to range between 0 and 100 in order to allow the regression coefficients to be interpreted as change in percent units. In doing so, those items with negative formulations were inverted in the coding so that the index variables would unequivocally indicate agreement with the attitude. Index variables were therefore always positive, and the more affirmative the attitude, the higher the value obtained.

In order to test the associations between the reported time spent on prosthodontic services and

the various dentist-related factors, a multiple regression model was obtained using number of weekly hours spent on prosthodontics as the dependent variable. Independent variables were constructed from the series of questions relating to:

4 social and demographic attributes (first part of the questionnaire, viz. gender, age, nationality, and working sector),

5 work pattern and work situation variables (sub-sections (a) and (b) of the second part of the questionnaire, viz. weekly total clinical hours, weekly adult treatment hours, level of demand at clinic, patient characteristics, and satisfaction as a dentist), and

attitudinal factors to be derived from the factor analysis, described above, of the items in sub-section (c) of the second part of the questionnaire.

All statistical analyses were performed on an IBM Personal Computer using SPSS 10.

Results

Among the responding dentists, 47% were males and 53% females. The mean age of the group was 33 years (range, 22 to 63). Forty-nine percent worked in the PS and 51% in the GS. A larger proportion of the males worked in the PS (57%) than in the GS, while comparatively more females worked in the GS (58%). The nationality distribution was 46% Saudis and 54% other nationalities, predominantly from neighbouring countries. Percentage distribution of other practice profile variables are listed in Table 1, together with bivariate analyses of the variables with respect to gender and working sector.

Large individual variations in some aspects of practice profile were evident. Total mean weekly working hours and hours spent treating adults were not different for males and females, but the time spent on prosthodontic treatment was

significantly higher for males (12.3 h, SD=7.8) than females (9.4 h, SD=6.2) ($P<0.05$). Comparing working sectors, PS dentists spent more hours totally doing clinical work compared to their GS colleagues.

Univariate analyses of the attitudinal items showed generally large standard deviations of the VAS values (Table 2), which reflect considerable individual variation. Strong agreement by most was recorded for items no. 1 (oral hygiene prerequisite; CV 15%), and no. 9 (close professional cooperation; CV 15%), while items no. 4 (age irrelevant to implant planning; CV 76%), and no. 7 (delegating impression making; CV 69%) were viewed negatively, but inconsistently so. Bivariately, there were varying differences in the distributions with respect to gender and working sector. For about half of the items, the differences exceeded 0.5 units, but for only 3 items were they strongly significant. Notwithstanding the negative

Table 3. Varimax rotated factor analysis (Principal components analysis) of attitudinal items.

Statement	Factor 1 (patient role)	Factor 2 (dentist influence)	Factor 3 (patient influence)	Factor 4 (technical aspects)	Communality (h ²)
When a patient chooses between different treatments, the dentist should encourage the patient to decide on his/her own (no. 6)	0.67				0.48
If you feel another dentist has provided inferior treatment for a patient, the patient should be advised to return to that dentist for re-treatment at no cost (no. 8)	0.66				0.45
Failure of prosthodontic therapy is generally the result of the patient's neglect (no. 11)	0.66				0.47
Missing posterior teeth should generally be replaced (no. 12)		0.64	-0.31		0.59
Only the dentist should carry out yearly check-ups (no. 5)		0.63			0.48
The dentist should perform all stages of treatment to make the patient feel safe (no. 10)		0.58			0.37
The patient must have good oral hygiene before any crown treatment can be considered (no. 1)		0.57		-0.38	0.59
Prior to prosthodontic treatment in the patient with a history of caries, dietary counselling is advisable (no. 13)			0.72		0.54
Patients with poor ability to pay do not need information regarding the most expensive treatments (no. 3)	0.41		-0.60		0.57
The implant option should always be given to the patient even if a conventional approach is possible (no. 2)	0.40		0.49		0.48
Close cooperation between dentists helps them to offer the best treatments possible to their patients (no. 9)		0.32	0.43		0.43
Age is of no concern when considering implant treatment for the edentulous patient (no. 4)				0.80	0.67
Impression making should normally be delegated to auxiliaries (no. 7)		0.34		0.69	0.61
Eigenvalue	2.15	1.65	1.54	1.38	
	13.9	13.7	11.9	11.9	

view for the whole group, males were far more positive that age was of little concern when considering implant therapy for edentulous patients (no. 4). GS dentists felt less strongly than PS dentists that missing posterior teeth should generally be replaced (no. 12), and agreed more strongly that dietary advice was necessary prior to prosthodontic treatment (no. 13).

In the factor analysis, none of the items had a communality of < 0.3, and thus all items were included in the final factor analysis (Table 3). Items were reduced to four factors, with a variance explanation of 52%. The 4 factors were interpreted to capture the dimensions of patient role (items no. 6, 8, 11), dentist influence (items no. 1, 5, 10, 12), patient information (items no. 2, 3, 9, 13), and technical aspects (items no. 4, 7). The component loadings on each factor were transformed into indices (0 to 100) (Table 4), which were set as additional independent variables in the multiple regression models.

The final multiple regression models for the total, and male and females groups were as follows (AWH = adult working hours; N = nationality; WS = working sector; F4 = technical aspects attitudinal factor; WWH = weekly working hours):

$$Y = -10.589 + 0.304 (\text{AWH}) + 0.691 (\text{N}) + 2.303 (\text{WS}) + 0.049 (\text{F4}), R^2 = 0.343 (\text{total})$$

$$Y = -6.739 + 0.485 (\text{WWH}), R^2 = 0.361 (\text{males})$$

$$Y = -0.382 + 0.188 (\text{AWH}) + 3.146 (\text{N}), R^2 = 0.194 (\text{females})$$

Significantly related independent variables with respect to weekly time devoted to prosthodontic treatment are summarized in Table 5. In the total model, working hours spent on adults, nationality, working sector and the attitude factor (F4) encompassing broadly technical aspects, were each significantly correlated. In the separate models, only total weekly working hours was significant for males, while working hours spent on adults and nationality were significant for females.

Table 4. Distribution of means and standard deviations of indices derived for attitudinal factors (0-100)

Variable	Total n = 137		Males n = 65		Females n = 72		PS n = 67		GS n = 70	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
F1 Patient role (0-100)	55	20	57	18	53	21		21	58	19
F2 Dentist influence (0-100)	73	15	75	15	71	16	51	15	70	16
F3 Patient information (0-100)	68	18	68	18	68	19	77	19	72	18
F4 Technical (0-100)	29	23	36	23	23	21	64	23	28	23

PS = private sector; GS = government sector

Discussion

In this study, the dentist-related factors that may influence the time that general dentists allocate to providing prosthodontic treatment in their clinical practices were investigated. Since underlying differences in patient needs and demands are important sources of variation in the rates of service, as homogeneous a patient base as possible to whom the services were being provided, would have been desirable. However, wide variations in dental service rates have been reported across clinics serving even socially homogeneous patient pools.^{1,10} Nevertheless, the convenience sampling used in the present study was a limitation, but was unavoidable due to unavailability of an accurate dental register. An attempt at purposive selection was made so as to represent relevant sub-groups of the total dental workforce. From the list of registered private clinics

that was available, private sector dentists were chosen so that coverage of the city was as broad as possible. Government sector dentists were drawn from the dental departments of most of the large hospitals and from smaller clinics. In spite of these empirical efforts to gain exposure to possible variation in population densities and socio-economic conditions, precise statistical generalization is not possible beyond the immediate population.

The questionnaire used was a modified version of one used in a national survey of Swedish dentists focussing on decision-making in a prosthodontic context.¹³ The reliability and discriminatory ability had been found to be satisfactory from a psychometric perspective,¹⁵ as was the case in the present version, which differed from the Swedish one only in some locally relevant respects. The response rate of 60% must be considered less than satisfactory, yet it is

acknowledged that the time period of 1 week for completion and return was short. Further, had information been available on non-responders, the survey error could have been reduced.

The sub-group compositions reflect the large addition to the dental workforce in recent years of Saudi dentists (46%), mostly younger (75% under 40 years), and a majority of them women (53%). The rapid expansion currently taking place in the private sector is also apparent, albeit intuitively so.

Although there were no differences in mean total weekly working time and mean adult treatment time between male and female dentists, there were differences between the two working sectors. In concurrence with other reports,^{10,15} private sector dentists in this study also worked longer total hours than government sector dentists. The proportion of male private sector dentists working clinically for more than 45 hours per week was greater than for all of the other sub-groups (Table 1). In other countries, wide variations in clinical working hours have been reported, with higher percentages of men working over 45 hours per week than women, and males spending considerably more of their clinical time on prosthodontic services.^{3,12} Although not presently investigated, wide variations, related to gender as well as to working sector, have been reported for the quantities of prosthodontic services actually produced, as well as their types.^{1,10,12}

Among the various social, practice profile and attitudinal aspects that were investigated, large individual variations were observed. This contrasted with the fairly small differences observed among groups, which in many instances were not statistically significant in the multivariate analyses. Specifically, the wide variation in individual responses to most attitude items, as indicated by the large standard deviations (Table 2), suggests that attitudes may be more individual, than group attributable.¹³ This large degree of variation is indicative of an underlying lack of homogeneity and consistency in dental care.^{1,10} Even so, factor analysis obtained four attitudinal dimensions which gave a variance explanation of 52% (Table 4), and compares favourably with the 56% variance explanation for similar attitudinal factors reported elsewhere.¹³ The first three factors obtained in the present study convincingly encompassed the common themes of patient role, dentist influence and patient information, while the fourth technical aspects factor was less so. However, in interpreting Table 3, the order of the factors reflects only their variance

explanation ability, not their substantive interpretation.

In the multiple regression analyses, by far the most important variable influencing the dependent variable weekly prosthodontic treatment hours was weekly adult treatment hours (Table 5). The association was highly significant in the total and the female models, while weekly total clinical hours was significant in the male model. The regression coefficient (b) in Table 5 should be interpreted in the context that different scales were used for the various independent variables. The value of 0.304 for weekly prosthodontic treatment hours (a continuous variable) suggests that for each additional reported hour spent on treating adults, the weekly time spent on prosthodontics increased by 0.3 h ($P < 0.001$). From this it follows that about 30% of all additional time used on adult care is devoted to prosthodontics. For the private vs. government sector variable, the value of 2.303 indicates the number of additional prosthodontic hours spent by GS dentists after adjustment of total working hours. This demonstrated that the importance of adult treatment hours to prosthodontic activity is remarkably similar to findings in Sweden.¹² Even though prosthodontic therapy is virtually exclusive to adult patients whichever the region being discussed, the closeness of the variance explanations observed in Riyadh and in Sweden is all the more interesting given the vastly different social, oral health status, oral health care systems, and educational conditions that apply in the two areas.

Other variables of differing significances in the total model were working sector, nationality, and the technical attitudinal factor (F4), while in the female model, nationality was significantly associated (Table 5). Contrary to other studies,^{10,12} neither gender nor age showed associations. In a Swedish report, females were significantly associated with relatively more working hours spent on prosthodontics, although producing smaller quantities of services.¹² In this regard, the present finding that working sector in the female model (Table 5) was significantly associated with more time spent on prosthodontics, could be partly explained by the relatively high female composition of the government sector, and the fact that the service is free and may thus increase patient demand. Elsewhere, private practitioners are known to spend more time on prosthodontic services than their government sector colleagues.¹⁵ The only attitudinal variable found to be moderately important was the one of a

technical dimension (F4), but also incorporating a positive attitude towards delegation of tasks. It seems reasonable that such an attitude would encourage greater involvement in prosthodontics, although it could also mean that time could be saved in the performance of procedures. However, this is not in line with an earlier finding that dentists with high prosthodontic service rates have a less positive attitude towards delegation than dentists with a low prosthodontic production.¹³

Table 5. Multiple regression models for weekly hours spent on prosthodontic treatment (only statistically significant associations shown)

Independent variables	Males n = 65 b	Females n = 72 b	Total n = 137 b
Social and demographic attributes			
Age (5-year categories)			
Gender (male vs. female)			2.303*
Working sector (PS vs. GS)			
Nationality (Saudi vs. non-Saudi)		3.146*	4.691***
Practice profile	0.485***		
Weekly total clinical hours (5-hr bands)		0.188**	
Weekly adult treatment hours (5-hr bands)			0.304***
Level of demand at clinic (3 categories)			
Patient characteristics (3 categories)			
Satisfaction as a dentist (3 categories)			
Dentists' attitudes (from factor analysis, Table 4)			
F1			
F2			
F3			

R-square: 0.361 (males), 0.194 (females), 0.343 (total model); P<0.05*, 0.01**, 0.001***

Overall, the relatively low precision of the regression models suggests a possible lack of a broad enough range of included dentist-related factors. Little variation in the time spent on prosthodontic services was explained by attitudes and beliefs. The absence of significant effects may reflect the low correlation between attitudes and behaviour found in a variety of other social contexts,¹⁶ or it may be due to the use of category rates which were too broad to detect significant relationships. However, the close resemblance of the present results with those obtained in a large Swedish population does suggest that factors

other than those covered by the questionnaire must be involved. More information about dentists' personalities, as well as about their patients' profiles, could have improved the explained variance, and warrant further investigation.

Conclusions

On the basis of the findings, it is clear that reported prosthodontic service rates in general dental practice can be regarded as a multi-dimensional process, involving a broad range of factors.

1. Although considerable individual variation in prosthodontic service rates was seen, differences, on a group basis, viz. gender, working sector, were smaller.
2. The most notable effect on the time devoted to prosthodontic services was the time spent on adult dental treatment.
3. Some of the variation was also explained by nationality in the total and female models, and total weekly clinical hours in the male model. Lesser effects were working sector, and the attitudinal dimension capturing technical aspects, in the total model.
4. All other dentist-related, and other attitudinal factors had insignificant effects on time devoted to prosthodontics.
5. The large unexplained variation in the reported rates of prosthodontic services may be due to other unmeasured characteristics of the dentist as well as the practice, which require further investigation.

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