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Development and evaluation of a Dental Patient Feedback on Consultation skills (DPFC) measure to enhance communication

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Objectives: To adapt an existing medical questionnaire on patient-provider communication for use in the dental setting, and to evaluate the performance of the measure in a first dental encounter (validity and reliability). ***Methods:*** A patient feedback questionnaire on consultation skills was adapted for use in dental settings through content and convergent validity. A survey of dentist consultation skills was conducted among adults attending a teaching hospital. Patients self-completed a 16-item *Dental Patient Feedback on Consultation* skills (DPFC) questionnaire during their first dental consultations. Repeat assessments were conducted on ~10% of the sample. Variations in DPFC responses (scale and item level) were examined in relation to socio-demographics and dental attendance pattern in bivariate and regression analyses. Internal reliability (*Cronbach's alpha*) and test-retest reliability (Intraclass Correlation Coefficient - ICC) were examined. ***Results:*** A DPFC questionnaire was derived following minor modifications. The clarity of items ranged from 81.1-100% and content validity index ranged from 0.73-1.00. Exploratory item factor analysis showed a one-dimensional construct. The response rate to the survey was 90.5% (389/430). Variations in DPFC scores with respect to global rating of satisfaction were apparent (P<0.001). *Cronbach's alpha* value was 0.94 and ICC value was 0.89. Bivariate and regression analyses identified dental attendance pattern as a key factor associated with DPFC (P<0.05); but no significant differences were observed with respect to socio-demographic factors. ***Conclusions:*** A DPFC questionnaire was adapted with acceptable validity and reliability. Dental service utilization pattern was associated with dentist-patient clinical communication rather than socio-demographics.

Key words: *clinic visit, clinical communication, dental, consultation, dentist-patient relations, Hong Kong, Chinese*

Introduction

It is clear that effective clinical communication between healthcare providers and patients plays an important role in consultations. Studies have found that good healthcare provider-patient communication can lead to better patient compliance (Ley, 1988), patient satisfaction (Cousin *et al.*, 2012; Sondell *et al.*, 2002) and treatment outcomes (Hamasaki *et al.*, 2011). In dentistry, studies related to patient satisfaction have received growing attention over the past three decades. In the 1980s, a number of 'dental satisfaction questionnaires' were developed to assess different dimensions of patient satisfaction e.g. quality of care and general satisfaction (Davies and Ware, 1982; Koslowsky *et al.*, 1974). However, there were concerns that the measures did not comprehensively assess the specific 'interpersonal encounter' aspects of the dental visit (Corah *et al.*, 1984). To this end, the Dental Visit Satisfaction Scale (DVSS) questionnaire, an analogous measure to the Medical Interview Satisfaction Scale, was derived (Wolf *et al.*, 1978). The DVSS questionnaire aimed to evaluate patients' perceptions of a dental consultation in terms of affective, cognitive, and behavioral aspects. This brief 10-item questionnaire predominantly focuses on patients' perception of the dentist's 'technical competence' rather than 'clinical communication' performance *per se*.

In the medical literature, there has been considerable focus on actual 'clinical communication' and a number of validated questionnaires to assess healthcare providers' clinical communication in medical consultations (Meakin and Weinman, 2002; Reinders *et al.*, 2009). A comprehensive measure with good psychometric properties is the Patient Feedback on Consultation skills, PFC (Reinders *et al.*, 2009). This arose from an adaption and extension of a previous measure with respect to the communicator competency profile for physicians by the Canadian Medical Education Directives for Specialists (Frank *et al.*, 2005; Stewart, 2003). The PFC questionnaire has been adapted for use in different settings, including accommodation of cultural and linguistic considerations (Reinders *et al.*, 2008).

In the dental literature, the absence of a specific comprehensive measure on clinical communication has hampered understanding of satisfaction regarding dental consultations. Providing that both medical and dental contexts share the key communication competence framework (Cowpe *et al.*, 2010; Frank *et al.*, 2005), this study aimed to adapt the PFC for the dental setting, to test its validity; and investigate the relationship between patients' perceptions of dentists' clinical communication performances with respect to socio-demographic factors and dental service utilization.

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Methods

Adaption of the PFC questionnaire for use in the dental setting started with the content validity of the PFC questionnaire being reviewed by a focus group, consisting of a panel of six subject matter experts including members of the dental team involved with 'first dental encounters' at the Reception and Primary Care (RPC) clinic. This panel was focused on the questionnaire translation quality in terms of: 1, the clarity of translation to the target group; 2, the semantic equivalence across languages; and 3, the conceptual equivalence across cultures. The RPC clinic is a unit within a teaching dental hospital that provides initial consultations open to all Hong Kong citizens and those suitable for teaching or research purposes are accepted as patients. The focus was on determining to what extent items of the questionnaire tapped into all relevant aspects of dental consultations, particularly 'the first dental encounter' as the focus of this study. In the second part of the study, a panel of 37 patients with previous dental consultation experience was invited to give comments on each item of the questionnaire in terms of the items' clarity their content importance. For the items' clarity, the respondents were asked to choose either 'Yes' or 'No' of each item. For content validity, participants were asked to rate each item on a 4-point scale of their relevance (responses: *not at all*, *a little*, *mostly*, *completely*) to them as patients at a first dental consultation. Content Validity Index (CVI) was calculated for each item (Lynn, 1986). In addition, two specific open-ended questions were employed to encourage participants to report any other aspects deemed relevant to the dental consultation process to enhance content validity (*Are there other important topics that are not addressed in these questions?* and *Do you have any additional comments?*). For convergent validity, the association between DPFC scores and global rating of satisfaction ("*How satisfied were you with discussion of your problems*") was assessed.

The third part of the study was designed to examine the performance of the modified PFC for the dental setting (DPFC). Variations in DPFC scores with respect to socio-demographics and dental service factors were explored. Considering sample size, judgment was required based on the sampling frame. Krejcie and Morgan (1970) have provided useful guidance on sample sizes based on sampling frame sizes and for a population of 7,000 (RPC clinic caters for ≈7,200 patients per year) they propose a sample size of 364. To account for a potential 20% non-response, 430 patients attending the RPC were invited randomly using random digit selection based on anticipated numbers attending that day (approximately 9-16 patients per session) to participate in the study.

Over a three-month period, May to July 2010, patients (except emergency cases) attending their first dental visits at the RPC clinic were recruited, informed of the study content and provided their written informed consent. Participants completed the DPFC questionnaire immediately after their consultations and provided information on their socio-demographic backgrounds (including gender, actual age, education level, working status, and their personal monthly income) and dental service utilization experiences. Patients were assured of confidentiality and that their participation or responses would not affect their consultation outcomes, present or future services at this teaching hospital. To assess test-retest reliability, 10% of the patients were asked via random sampling (selected by an independent researcher) to repeat the DPFC within a one-week period.

The data were analyzed by the Predictive Analytics Software (PASW®) v.18.0 with a significance level of 0.05. To assess convergent validity, the association between DPFC scores and global rating of satisfaction was determined by analysis of variance (ANOVA). Exploratory item factor analysis was examined and compared with the original article. The internal consistency of the DPFC questionnaire was assessed by Cronbach's alpha statistics and the test-retest reliability was assessed by the Intraclass Correlation Coefficients (ICC). Variations in DPFC summary scores (and individual item responses) were explored in bivariate analyses using independent t-test with respect to socio-demographic factors and dental service utilization. Factors were dichotomized for analyses that based on the information and local policies of the Hong Kong Special Administrative Region (i.e. the retirement age, the free education provided in Hong Kong, the median individual monthly income, and the recommended annual dental check-up). Following on, regression analyses with backward selection was conducted based on summary DPFC scores (the total score of individual items) as the dependent variable accounting for socio-demographic and dental service utilization factors.

This study was approved by the Institutional Review Board of the University of Hong Kong / Hospital Authority Hong Kong West Cluster (IRB Reference Number: UW 10-151).

Results

With minor modification to the original, the PFC was adapted for use in the dental setting (Figure 1 and available in Chinese from the first author and as an appendix to the online version of this paper). Modifications included changes to item wordings from 'doctor' to 'dentist' and other related dental terms. Forward-backward translation of items by a bilingual panel enabled a traditional Chinese language version to be derived for use in the local setting. The panel of patients rated each item's clarity to be high, >80% with item 9 being the most ambiguous item. The content validity index (CVI) was calculated for each item and ranged from 0.73 for item 9 to 1.00. Item 9 was clarified by adding a specific example of what was meant by 'personal and family issues' namely 'medical history and family habits'. No additional items were added from open-ended feedback. In the exploratory item factor analysis, this study found first eigen-value of 8.52 and a second eigen-value of 1.15, which was similar to the original values of the measure (8.90 and 1.21 respectively). The explained variance for the first factor was 55%, which was similar to the original result of 56%.

Among the 430 patients encountering first dental visits at the RPC clinic, 411 agreed to participate though 22 questionnaires were incomplete and not amenable to analysis: a response rate of 90.5% (389/430). The ceiling effect of the maximum score (i.e. answered 'completely' to all items) was 3.1% and no floor effect (i.e. answered 'not at all' to all items) was found. The profile of the study population is presented in Table 1.

In terms of convergent validity, variations in DPFC scores with respect to global rating of satisfaction were apparent ($F=162.0$, $df_{between\ groups}=3$, $df_{within\ groups}=385$, $p<0.001$). Upon Bonferroni multiple comparison correction, 'completely satisfied' (n=136, mean 40.17, SD 6.41) > 'mostly satisfied' (n=167, mean 31.06, SD 6.31) > 'a little satisfied' (n=73, mean 22.64, SD 7.43) > 'not satisfied' (n=13, mean 11.85, SD 5.91).

The Cronbach's alpha value (α) for the DPFC measure was 0.94. The alpha value ranged from 0.931 to 0.936 if any DPFC item was deleted from the analysis except item 9 which gave 0.940. Inter-item correlation ranged from 0.27 (item 5 to item 9) to 0.72 (item 15 to item 16). Repeat assessments (test-retest reliability) gave an ICC value for summary scores of 0.89 (n=42, ~10%) with individual items ranging from 0.73 (item 4) to 0.97 (item 9).

Turning to the relationship between DPFC, socio-demographic factors and dental service utilization, the responses to individual items are presented in Figure 1. With the exception of 'discussing personal or family issues that might affect oral health' (item 9), most aspects of clinical communication were covered in the consultation. Most frequently, participants felt that their consulting dentist was comprehensive with respect to 'listening to what they had to say' and that the 'dentist explained the problem' to them (89.7%, 349 'mostly/completely' and 87.7%, 341 respectively).

Table 1. Profile of respondents with results of independent t-test in summary clinical communication scores (n=389)

Background Factors	%	n	Mean	SD	P-value
Gender					
Male	34.7	135	32.3	9.2	0.643
Female	65.3	254	31.9	10.2	
Age					
Aged ≤55	72.2	281	31.8	9.7	0.561
Aged >55	27.8	108	32.5	10.2	
Educational Level					
Below secondary	68.1	265	32.0	10.2	0.964
Higher education	31.9	124	32.1	8.9	
Working Status					
Working	54.5	212	31.6	9.9	0.368
Not working	45.5	177	32.5	9.8	
Personal Monthly Income (HK$)*					
<10,000	73.5	286	31.6	10.2	0.196
10,000+	26.5	103	33.1	8.6	
Last Dental Visit					
≤12 months	46.3	180	30.3	10.2	**0.001**
>12 months	53.7	209	33.5	9.3	

SD Standard deviation; * HK$7.8≈US$1

Clarity (%)	*N*	*CVI value*	*№ Question items*
86	32	0.81	1 To what extent was your main problem(s) discussed today?
95	35	0.89	2 How satisfied were you with the discussion of your problem?
100	37	1.00	3 To what extent did the dentist listen to what you had to say?
100	37	0.95	4 To what extent did the dentist explain this problem to you?
92	34	0.78	5 To what extent did you and the dentist discuss your respective roles?
97	36	0.95	6 To what extent did the dentist explain treatment?
100	37	0.92	7 To what extent did the dentist explore how manageable this treatment would be for you?
97	36	0.95	8 How well do you think your dentist understood you today?
81	30	0.73	9 To what extent did the dentist discuss personal or family issues that might affect your oral health? (e.g. Medical history/ Family habits)
100	37	0.86	10 Was there an atmosphere of trust during the consultation?
100	37	0.89	11 To what extent did the dentist show his/her concern?
95	35	0.81	12 To what extent did the dentist invite you to ask all the questions you wanted to ask?
100	37	0.89	13 To what extent did the dentist give you clear information and explanation?
97	36	0.92	14 To what extent did the dentist act in a structured way?
97	36	0.95	15 To what extent did the dentist give you new or better insight into your problem?
100	37	0.97	16 To what extent did the dentist give you clear treatment advice?

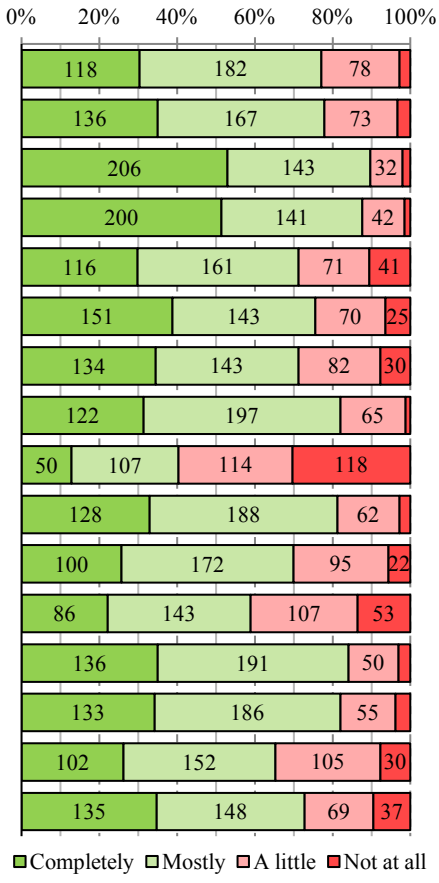

Figure 1. *Dental Patient Feedback on Consultation skills (DPFC) items with their clarity percentage, number (N), and content validity index (CVI, fraction of 37 experts rating that item 'mostly' or 'completely' relevant) with their corresponding 389 respondents' responses*

Table 2. Results of independent t-test according to backgrounds of respondents and questionnaire items

Items	*Gender (Male vs Female)*	*Age (≤55 vs >55)*	*Education Level (below secondary vs higher education)*	*Working Status (working vs not working)*	*Personal Monthly Income (<10K vs 10K+)*	*Last Dental Visit (≤12months vs >12months)*
1	0.761	0.061	0.971	**0.021**	0.229	0.413
2	0.778	**0.029**	0.613	0.058	0.694	**0.001**
3	0.752	0.222	**0.031**	0.587	**0.016**	0.204
4	0.532	0.935	0.610	0.623	0.324	**0.001**
5	0.378	0.745	0.550	0.844	0.120	**0.025**
6	0.704	0.155	0.409	0.182	0.631	**0.009**
7	0.509	0.483	0.324	0.969	0.528	**0.001**
8	0.586	**0.028**	0.548	0.134	0.930	**0.012**
9	0.991	0.937	0.884	0.296	0.773	0.131
10	0.970	0.082	0.320	0.112	0.692	**0.042**
11	0.751	0.706	0.942	0.243	0.321	**0.017**
12	0.993	0.662	0.538	0.816	0.168	**0.026**
13	0.626	0.573	0.410	0.364	0.697	**0.008**
14	0.559	0.272	0.611	0.684	0.177	**0.001**
15	0.802	0.661	0.275	0.476	0.062	0.095
16	0.385	0.493	0.187	0.720	**0.003**	0.065
All items	0.643	0.561	0.964	0.368	0.196	**0.001**

Figure 1 gives the wording of the items numbered in this table. of each item (n=37)

Socio-demographic variations in summary scores and item ratings are presented in Table 2. At the individual item level, a few significant socio-demographic variations were observed but no significant differences in summary scores were observed (P>0.05). With respect to dental service utilization, as shown in Table 1 participants whose last dental visit was at least a year before they came to the RPC clinics rated the dentist as significantly higher on the DPFC in general, compared with participants who had had a dental visit within the year before coming to the RPC clinic (P=0.001) they also rated their RPC dentist higher on 11 of the 16 items. Regression analyses also identified that only dental attendance pattern was associated with summary clinical communication scores (P=0.001) in the final model. The unstandardized coefficient, B, for the analysis was 3.18 with 95% confidence interval 1.24, 5.12.

Discussion

It has been reported that patients are more concerned about their dentist's attitudes and communication skills than their dentist's technical competences (Newsome and Wright, 1999). To this end, a questionnaire was adapted for use in the dental context focusing specifically on dentist-patient communication and its performance was evaluated. The clarity was high with items rating at above 80% generally. Furthermore, with the exception of item 9, the CVI values were no lower than 0.78 suggesting acceptable levels of content validity (Lynn, 1986). Item 9 proved to be a difficult item both from statistical evaluation and feedback from both dental and patient panels so was modified by adding specific examples of personal and family issues (i.e. medical history and family habits).

In the psychometric testing of the adapted measure – DPFC, the response rate was good indicating the feasibility of employing patient-based assessments in clinical practice. Of note, the socio-demographic profile of the group differs from that of the local population but reflects the client base of the teaching hospital (lower levels of educational attainment and lower income levels) (Zheng *et al.*, 2011). Nonetheless, the sample provided a range in profile that was amenable to identify differences between groups.

Responses to the DPFC items showed variation in how such aspects were addressed. While in general, participants perceived most aspects of the dental consultations were 'mostly/completely' covered, some aspects, however, fared less well, for example item 9: '*extent to which dentist discussed personal or family issues that might affect your oral health*'. This concurs with findings in the medical setting (Reinders *et al.*, 2009). The importance of social and medical determinants to oral health has been increasingly recognised and is, therefore, critical to consider in patient assessment (Sangare *et al.*, 2012). It appears there is a need to translate such theoretical evidence into everyday practice and to educate patients and oral healthcare providers about the importance of such factors to oral health and oral health care (Locker and Gibson, 2006).

Variations in DPFC scores were apparent with respect to global rating of satisfaction. The higher the global rating, the higher the mean DPFC scores demonstrating the convergent validity. Furthermore, similar factor analysis results compared with the original article also support the convergent validity of the DPFC. There were few socio-demographic variations in DPFC which highlights similarity in dentist-patient' communication across groups which was a welcome finding as this is a key competency of dental practice – equal treatment of all irrespective of socio-demographics (Department of Health HKSAR, 2002). Dental visit pattern was associated with dentist-patient communication across a range of items in bivariate analyses and remained significant in the final regression model. The observation that those who had attended a dentist within the past year (elsewhere) provided lower communication ratings can be anticipated. This may reflect their ongoing frustration with recently unresolved oral problems and possible annoyance at having to seek treatment elsewhere. In addition, their experience of the dental encounter may have influenced their perceptions and made them more critical consumers. Further exploration of factors including time between dental visits, which affect patients' perception of dentist-patient communication, is warranted.

The target subject of this study focused on patients who had their first dental consultation in the teaching hospital. A limitation of this study was that it did not allow for the testing of discriminant validity and that the results are limited to a single sample. Furthermore, it should also be noted that the sample size calculation was based on sample size requirements for a random sample. It is acknowledged that for the regression analyses the sample size may have been underpowered owing to the large number of variables considered, and so limited detection of small effect differences.

Conclusions

A patient feedback on consultation skills assessment has been adapted for the dental setting and its performance evaluated. The measure showed good item clarity, validity (content and convergent) and reliability (internal consistency and test-retest). Variations in dentist-patient communication skills were associated with dental attendance pattern with lower satisfaction related to recent experience at other sites.

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References

Corah, N., O'Shea, R., Pace, L.F. and Seyrek, S.K. (1984): Development of a patient measure of satisfaction with the dentist: The dental visit satisfaction scale. *Journal of Behavioral Medicine* **7**, 367-373.

Cousin, G., Mast, M.S., Roter, D.L. and Hall, J.A. (2012): Concordance between physician communication style and patient attitudes predicts patient satisfaction. *Patient Education and Counseling* **87**, 193-197.

Cowpe, J., Plasschaert, A., Harzer, W., Vinkka-Puhakka, H. and Walmsley, A.D. (2010): Profile and competences for the graduating European dentist–update 2009. *European Journal of Dental Education* **14**, 193-202.

Davies, A.R. and Ware, J.E. (1982): *Development of a dental satisfaction questionnaire for the health insurance experiment*. Santa Monica, California: Rand Corporation.

Department of Health HKSAR. (2002): *Oral Health Survey 2001: Common dental diseases and oral health related behaviour*. Hong Kong: HKSAR.

Frank, J., Jabbour, M., Frechette, D., Marks, M., Valk, N. and Bourgeois, G. (2005): Report of the CanMEDS Phase IV Working Groups. *Ottawa: The Royal College of Physicians and Surgeons of Canada*.

Hamasaki, T., Soh, I., Takehara, T. and Hagihara, A. (2011): Applicability of both dentist and patient perceptions of dentists' explanations to the evaluation of dentist-patient communication. *Community Dental Health* **28**, 274-279.

Koslowsky, M., Bailit, H. and Valluzzo, P. (1974): Satisfaction of the patient and the provider: evaluation by questionnaire. *Journal of Public Health Dentistry* **34**, 188-194.

Krejcie, R.V. and Morgan, D.W. (1970): Determining sample size for research activities. *Educational and Psychological Measurement* **30**, 607-610.

Ley, P. (1988): *Communicating with patients: improving communication, satisfaction and compliance.* New York, NY, US: Croom Helm.

Locker, D. and Gibson, B. (2006): The concept of positive health: a review and commentary on its application in oral health research. *Community Dentistry and Oral Epidemiology* **34**, 161-173.

Lynn, M.R. (1986): Determination and quantification of content validity. *Nursing Research* **35**, 382-385.

Meakin, R. and Weinman, J. (2002): The 'Medical Interview Satisfaction Scale' (MISS-21) adapted for British general practice. *Family Practice* **19**, 257-263.

Newsome, P. and Wright, G.H. (1999): A review of patient satisfaction: 2. Dental patient satisfaction: an appraisal of recent literature. *British Dental Journal* **186**, 166-170.

Reinders, M.E., Blankenstein, A.H., Knol, D.L., de Vet, H.C.W. and van Marwijk, H.W.J. (2009): Validity aspects of the patient feedback questionnaire on consultation skills (PFC), a promising learning instrument in medical education. *Patient Education and Counseling* **76**, 202-206.

Reinders, M.E., Blankenstein, A.H., van Marwijk, H.W.J., Schleypen, H., Schoonheim, P.L. and Stalman, W.A.B. (2008): Development and feasibility of a patient feedback programme to improve consultation skills in general practice training. *Patient Education and Counseling* **72**, 12-19.

Sangare, A.D., Samba, M. and Bourgeois, D. (2012): Illness-related behaviour and sociodemographic determinants of oral health care use in Dabou, Cote d'Ivoire. *Community Dental Health* **29**, 78-84.

Sondell, K., Soderfeldt, B. and Palmqvist, S. (2002): Dentist-patient communication and patient satisfaction in prosthetic dentistry. *International Journal of Prosthodontics* **15**, 28-37.

Stewart, M.A. (2003): *Patient-centered medicine, transforming the clinical method* 2nd edn. Oxford: Radcliffe.

Wolf, M.H., Putnam, S.M., James, S.A. and Stiles, W.B. (1978): The Medical Interview Satisfaction Scale: Development of a scale to measure patient perceptions of physician behavior. *Journal of Behavioral Medicine* **1**, 391-401.

Zheng, J., Wong, M.C.M. and Lam, C.L.K. (2011): Key factors associated with oral health-related quality of life (OHRQOL) in Hong Kong Chinese adults with orofacial pain. *Journal of Dentistry* **39**, 564-571.