

The perceived acceptability of the DEPPA patient assessment tool: A questionnaire survey of Denplan Excel patients

J. T. Newton*¹ and K. Asimakopoulou¹

In brief

Discusses the Denplan Previser Patient Assessment (DEPPA) tool which is designed to provide patients with information on their future risk of dental and oral disease.

Reports on a study which determined that dental practitioners found the tool acceptable, and a useful way to improve communication with patients.

Suggests that the DEPPA tool is an acceptable way to present patients with information on their risk of oral disease.

Aim To establish the perceived acceptability of the use of the Denplan/Previser Patient Assessment tool (DEPPA) by patients. The secondary aim was to examine dental practitioners' views about the effects of a DEPPA consultation on patients' future oral health behaviours. **Method** Two questionnaire surveys: 365 patients attending general dental practice, who had been assessed using the DEPPA software; 12 dental practitioners who had completed a DEPPA assessment on the patients. Participants (both patients and GPs) completed the Treatment Evaluation Inventory (TEI) to ascertain their views of the DEPPA assessment. **Findings** The overall mean for the Treatment Evaluation Instrument for the patients was 23.81 (SD 5.08), and for GPs 23.81 (SD 2.99). **Conclusion** Participants expressed a high level of acceptability of the DEPPA tool. In particular, the tool is seen as enhancing the relationship between the patient and practitioner and providing information to support behaviour change.

Introduction

The Denplan/Previser Patient Assessment tool (DEPPA) is an online tool for the assessment of patients in Denplan Excel accredited practices.¹ It seeks to assess the risk of future disease on the basis of risk factors identified from the patient's medical history, dental history, lifestyle and current clinical condition. DEPPA also produces a score to indicate the patient's current state of oral health. The programme benefits from extensive empirical validation of its evidence based algorithms.² The disease risk DEPPA provides is personalised, uses risk scores and can incorporate graphs and, as such, is set to communicate disease risk using the best available evidence. A recent review of risk assessment tools for periodontal disease³

identified that five such instruments exist, and further that risk assessment tools such as DEPPA can be used to predict future deterioration in periodontal health in the absence of treatment. However, there is little published literature on the effect of risk communication on patient behaviour, and the acceptability of such measure to patients and dental practitioners.

Risk communication of future disease has a long research tradition.⁴⁻⁷ What is clear is that healthcare professionals and patients alike have difficulties conveying and understanding risk information, especially when such information is communicated in general ways (for example, 'you are at risk for gum disease') and uses long future time-frames.^{8,9} It is now accepted that where disease risk communication takes place this information should be tailored to the individual and communicated using simple risk scores and graphs.⁶

The effects of risk communication on patients in oral health settings are relatively unexplored with only one recent RCT reporting positive behavioural impacts of individualised risk communication on patients being assessed for periodontal treatment.¹⁰ However, in medicine

risk communication of future disease has been associated with corrections of patients' unduly pessimistic views about their risk of future illness and with improvements in patient mood. Risk communication of future disease risk may have an impact on patients' views of dental treatment. Evaluation of patients' views of the treatment they have received is a critical component of the introduction of a new service development. Historically, there has been much focus on patient satisfaction with care; though it has been argued that the concept of 'satisfaction' was often used uncritically and without an analysis of the theoretical basis for the construct.¹¹ Furthermore, a review of patient satisfaction studies in dentistry, undertaken by Newsome and Wright,^{12,13} identified that there was a lack of psychometrically sound measures of patient satisfaction with dental services; most studies had developed their own measures of satisfaction while the two most developed scales, the Dental Visit Satisfaction Scale¹⁴ and the Dental Satisfaction Questionnaire¹⁵ each had their own limitations.

The concept of the *social validity* of dental treatments, based on the work of Wolf,¹⁶

¹Social and Behavioural Sciences, Population & Patient Health, King's College London Dental Institute, Floor 18, Tower Wing, Guy's Hospital, London, SE1 9RT
*Correspondence to: Professor Jonathan Tim Newton
Email: tim.newton@kcl.ac.uk

Refereed Paper. Accepted 20 March 2017
DOI: 10.1038/sj.bdj.2017.453

suggests that there are three important questions to address in order to determine the social relevance of treatment:

1. Does society deem the program goals to be desirable and appropriate for the client?
2. Are the client and the significant people in their life satisfied with the change that occurred during treatment?
3. Are the procedures used to achieve change acceptable to the client, their significant others and the broader community?

Social validity is perceived to be a broader concept than satisfaction, and aligns with concepts discussed by public health physicians – it is enshrined in the Primary Health Care Approach,¹⁷ it is included as a dimension of access¹⁸ and definitions of need.¹⁹ Furthermore, treatment acceptability has been shown to be important in ensuring good outcomes. If a treatment is deemed acceptable to patients it is more likely that they will adhere with healthcare professionals’ advice and also show improvements in their condition.²⁰

Although the patient experience is of paramount importance, it is equally important that with any new service initiative the views of those asked to engage with, adopt and deliver the new service are also sought; it follows that unless dental practitioners see DEPPA as a helpful tool towards patient health improvement, they are unlikely to use it. At the same time, work in medical settings has shown that physicians’ views of their patients’ health beliefs were grossly inaccurate and differed from patients’ own views.²¹ It is for this reason

that this project seeks to assess dentists’ and patient views about DEPPA separately and where appropriate look for common patterns and areas for further development.

The primary aim of this project, therefore, was to establish the perceived acceptability of the use of DEPPA by patients. The secondary aim was to examine dental practitioners’ views about the effects of a DEPPA consultation on patients’ future oral health behaviours.

Method

Design

The study comprised two questionnaire surveys using parallel versions of the Treatment Evaluation Inventory (TEI).^{22,23} Dentists participating in the Denplan Excel scheme who have used the DEPPA programme were surveyed, as well as patients following the appointment in which they completed their assessment with DEPPA. The survey method adopted followed guidelines on the design of surveys to maximise response rates.^{24,25} There was one main mailing and one follow up mailing.

Participants

Dental practitioners

- Inclusion criteria: Dentists who have undertaken at least 20 DEPPA assessments
- Exclusion criteria: Dentists who have not completed 20 DEPPA assessments.

Patients

- Inclusion criteria: Adult patients undergoing their first DEPPA assessments

- Exclusion criteria: Insufficient familiarity with written English required to complete the questionnaire.

The demographic characteristics of patients attending Denplan Excel dentists are as follows: 43% are male; 17% are aged 35 or younger, 31% are aged over 65. No other information was collected on the age of the patients.

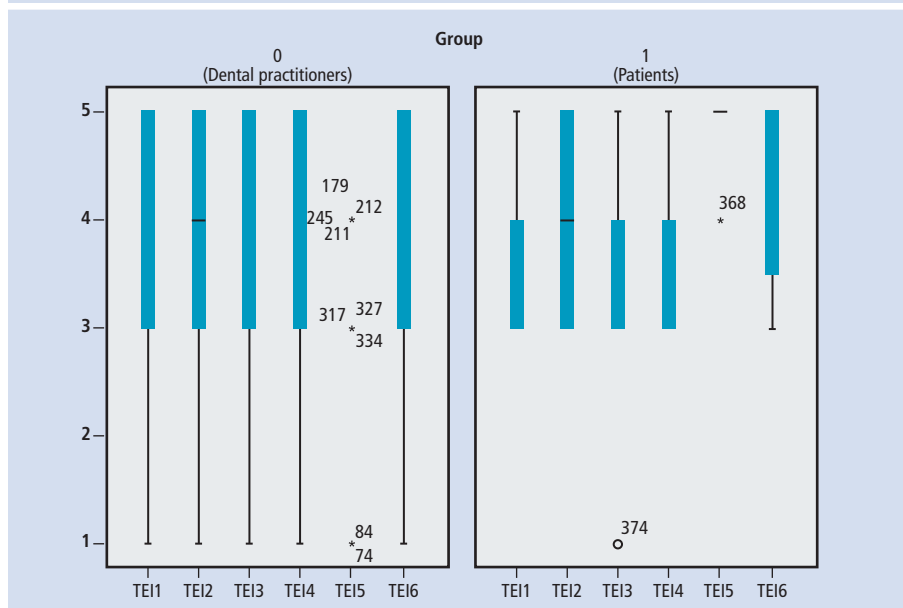
Procedure

The study had a two stage recruitment procedure for dental practitioners. Those dentists (N = 158) meeting the entry requirements for the study were sent a letter of invitation and asked to consent to participation, in the second stage those that consented (N = 52) were deemed to be participants. The remaining 106 dentists either replied to opt out of the research, or did not respond to the initial recruitment approach and were therefore deemed not to consent to participation. The participating dentists were sent copy of the Treatment Evaluation Inventory for practitioners (TEI-Practitioner) for completion. In addition they received 50 copies of the Treatment Evaluation Inventory for patients (TEI-patient) questionnaire to give to patients who completed a DEPPA assessment in their practice over a one-month period. The dental practitioners were asked to give a copy of the TEI-patient to each patient following completion of the DEPPA assessment. Participants were asked to complete the questionnaire immediately if they chose to, and to return the questionnaire (completed or uncompleted) to a sealed box at the dentist reception desk before

Table 1 Distribution of item responses to the Treatment Evaluation Inventory (TEI) items – TEI dental practitioners (N = 12)

	Item response – Higher scores indicate greater acceptability				
	1	2	3	4	5
Item 1: How much more knowledge about the current health of their teeth and mouth do you think your patients have now compared to before you used the DEPPA?	0	1 (8%)	7 (53%)	2 (17%)	2 (17%)
Item 2: How much more knowledge about their future risk of dental disease do you think your patients have now compared to before you used the DEPPA?	0	0	5 (42%)	3 (25%)	4 (33%)
Item 3: Do you think your patients now have more information about how to look after the health of their teeth and mouth?	2 (17%)	0	5 (42%)	3 (25%) 2 (17%)	
Item 4: How much do you think your patients’ understanding of how to look after the health of their teeth and mouth has improved?	0	0	6 (50%)	3 (25%)	2 (17%)
Item 5: How would you rate your relationship generally with those patients who completed the DEPPA assessment?	0	0	0	2 (17%)	10 (83%)
Item 6: Please rate how much you feel your patients will be able to use and apply what they learned from the assessment?	0	0	4 (33%)	2 (17%)	6 (50%)

Fig. 1 Box plot summary of data for dental practitioners and patients



leaving. This sought to ensure that potential participants did not feel under an obligation to complete the questionnaire.

The Treatment Evaluation Inventory

The Treatment Evaluation Inventory^{22,23} is a commonly used measure of the acceptability of treatments. In this study we used the six-item form, which has rating scales with anchors of five points. Within dentistry this inventory has been used to evaluate interventions for people with dental phobia;^{26,27} and behavioural management techniques in children.²⁸ Outside the field of dentistry the scale has been used to evaluate interventions for people with mental retardation,²⁹ children

and adolescents with behaviour problems^{22,23} and young people with eating disorders.^{30,31} It has been demonstrated to show good internal consistency and criterion related validity in both the full 19-item form and in several short forms including the six-item form to be used in this study.^{32,33} Versions are available for patients to rate their treatment, and for practitioners to rate their perceptions of the acceptability of the scale.

Sample size calculation

Previous data on DEPPA activity among Denplan Excel Dentists suggests that there are 158 dentists who would meet the inclusion criteria. Over a one month period these

dentists would be anticipated as completing in the region of 2,600 DEPPA assessments (Chapple, personal communication).

Assuming an overall response rate of 25% this would give a sample size of approximately 39 dentists and 650 patients. These sample sizes will be sufficient to provide a high degree of precision in the estimates of the mean values for the Treatment Evaluation Inventory ($\pm 4\%$).

Statistical methods

The following descriptive statistics were calculated:

Mean Total TEI scores for dental practitioners and patients

Item by item analysis of TEI responses for both dental practitioners and patients.³⁴

Findings

Views of patients

A total of 365 patients returned questionnaires (56.2% of the anticipated sample size). The responses of the patients to the individual TEI items are summarised in Table 1 and Figure 1. The overall mean for the TEI for the patients was 23.81 (SD 5.08).

Views of dental practitioners

Responses were received from 12 dental practitioners – a response rate of 7.6% of eligible dentists, or 23.1% of dentists that consented to participation. Table 2 below shows the distribution of item responses to the Treatment Evaluation Inventory items, given by dental practitioners. The mean overall TEI score for practitioners was 23.81 (SD 2.99) (see also Figure 1).

Table 2 Distribution of item responses to the Treatment Evaluation Inventory (TEI) items – TEI patients (N = 365)

	Item response – Higher scores indicate greater acceptability				
	1	2	3	4	5
Item 1: How much more knowledge about the current health of your teeth and mouth do you think you have now compared to before you completed the DEPPA?	24 (7%)	3 (1%)	178 (49%)	25 (7%)	135 (37%)
Item 2: How much did you learn about your future risk of dental disease	14 (4%)	5 (1%)	143 (39%)	22 (6%)	181 (50%)
Item 3: Do you think you now have more information about how to look after the health of your teeth and mouth	33 (9%)	8 (2%)	144 (40%)	25 (7%)	155 (43%)
Item 4: How much do you think your understanding of how to look after the health of your teeth and mouth has improved?	33 (9%)	17 (5%)	162 (44%)	25 (7%)	128 (35%)
Item 5: How would you rate your relationship with the person who did your DEPPA assessment?	2 (1%)	0	43 (12%)	12 (3%)	308 (84%)
Item 6: Please rate how much you feel you can use and apply what you learned from the assessment?	6 (2%)	7 (2%)	109 (30%)	23 (6%)	220 (60%)

Discussion

This study explored the perceived acceptability of the DEPPA tool among patients and practitioners. Overall the scale was viewed as highly acceptable by both groups. The mean ratings for the overall TEI scores are comparable to the highest ratings of acceptability given for other interventions (see for example reference 30). For patients the highest scoring items concerned the relationship that they have with the person delivering the DEPPA – there is a perception of a good relationship, and patients also feel that they are able to use the information given to improve their oral health. For both patients and practitioners the item with the least positive responses (though still overall the majority held positive views) was the item relating to increased knowledge. Two possibilities exist for the interpretation of this finding: (1) patients may have good prior knowledge and that information provided during the DEPPA assessment provided no additional benefit, or (2) the DEPPA assessment could be improved by providing an additional element of knowledge provision to support behaviour change. Thus given the risk perception information provided by DEPPA, patients may additionally benefit from structured interventions to support behaviour change.^{10,35}

There are a number of limitations which affect the conclusions that can be drawn from this survey. Data on the demographic characteristics of the participants was not available. In the absence of any demographic characteristics of both patients and practitioners it is impossible to know the degree to which this sample is representative of the general practice population, or indeed those attending Denplan Excel practices, or whether the practitioners are typical of their colleagues. The response rate was lower than expected which again suggests that it is difficult to infer whether the samples are representative. The smaller than expected sample size also means that the accuracy of the estimates is lower than anticipated.

Conclusion

Within the limitations of the study, there is a high level of expressed acceptability of the DEPPA tool. In particular the tool is seen as enhancing the relationship between the patient and practitioner and providing information to support behaviour change.

Acknowledgements

Access to Denplan Excel dental practitioners and patients was facilitated by Dr Mike Busby and Dr Elizabeth Chapple of Denplan Limited. Information on the demographic characteristics of patients was provided by Antionette Weller.

- Busby M, Matthews R, Chapple E, Chapple I. Novel online integrated oral health and risk assessment tool: development and practitioners' evaluation. *Br Dent J* 2013; **215**: 115–120.
- Page R C, Martin J, Krall E A, Mancl L, Garcia R. Longitudinal validation of a periodontal risk calculator. *J Clin Periodontol* 2003; **30**: 819–827.
- Lang K, Suvan J, Tonetti M. Risk factor assessment tools for the prevention of periodontitis progression: a systematic review. *J Clin Periodontol* 2015; **42**: 559–70.
- Edwards A. Communicating risks through analogies. *BMJ* 2003; **327**: 749.
- Edwards A, Elwyn G, Mulley A. Explaining risks: turning numerical data into meaningful pictures. *BMJ* 2002; **324**: 827–830.
- Edwards A, Unigwe S, Elwyn G, Hood K. Effects of communicating individual risks in screening programmes: Cochrane systematic review. *BMJ* 2003; **327**: 703–709.
- Gigerenzer G, Edwards A. Simple tools for understanding risks: from innumeracy to insight. *BMJ* 2003; **327**: 741–744.
- Asimakopoulou K G, Fox C, Spimpolo J, Marsh S, Skinner T C. The impact of different time frames of risk communication on Type 2 diabetes patients' understanding and memory for risk of coronary heart disease and stroke. *Diabet Med* 2008; **25**: 811–817.
- Asimakopoulou K G, Skinner T C, Spimpolo J, Marsh S, Fox C. Unrealistic pessimism about risk of coronary heart disease and stroke in patients with type 2 diabetes. *Patient Educ Couns* 2008; **71**: 95–101.
- Asimakopoulou K, Newton J T, Daly B, Kutzer Y, Ide M. "The effects of providing periodontal disease risk information on psychological outcomes randomized controlled trial". *J Clin Periodontol* 2015; **42**: 350–355.
- Newton T. Involving the 'consumer' in the evaluation of dental care: A philosophy in search of data. *Br Dent J* 2001; **191**: 650–653.
- Newsome P R H, Wright G H. A review of patient satisfaction: 1. Concepts of satisfaction. *Br Dent J* 1999; **186**: 161–165.
- Newsome P R H, Wright G H. A review of patient satisfaction: 2. Dental patient satisfaction: An appraisal of recent literature. *Br Dent J* 1999; **186**: 166–170.
- Corah N, O'Shea R. Development of a patient measure of satisfaction with the dentist: The dental visit satisfaction scale. *J Behav Med* 1984; **7**: 367–373.
- Davies A, Ware J. Measuring patient satisfaction with dental care. *Soc Sci Med* 1981; **15**: 751–760.
- Wolf M M. Social validity, the case for subjective measurement or how applied behavior analysis is finding its heart. *J Appl Behav Anal* 1978; **11**: 203–214.
- World Health Organisation/UNICEF. Primary Health Care, Alma Ata 1978. 'Health for All' Series No. 1. Geneva: World Health Organisation, 1978.
- Penchansky R, Thomas J W. The concept of access – Definition and relationship to consumer satisfaction. *Med Care* 1981; **19**: 127–140.
- Matthew G K. Measuring need and evaluating services. In G McLachlan (ed) *Portfolio for health*. Oxford: Oxford University Press, 1972.
- Tarnowski K J, Simonian S J. Assessing treatment acceptance: The abbreviated acceptability rating profile. *J Behav Ther Exp Psychiat* 1992; **23**: 101–106.
- Street R L Jr, Haidet P. How well do doctors know their patients? Factors affecting physician understanding of patients' health beliefs. *J Gen Intern Med* 2011; **26**: 21–27.
- Kazdin A E. Acceptability of aversive procedures and medication as treatment alternatives for child deviant behavior. *J Abnorm Psychol* 1984; **12**: 289–301.
- Kazdin A E, French N H, Sherick R B. Acceptability of alternative treatments for children: evaluation by inpatient children, parents and staff. *J Consult Clin Psychol* 1981; **49**: 900–907.
- Edwards P, Roberts I, Clarke M *et al*. Increasing response rates to postal questionnaires: systematic review. *BMJ* 2002; **324**: 1183–1185.
- Dillman D. *Mail and telephone surveys: The total design method*. New York: Wiley, 1978.
- Forbes M L, Boyle C A, Newton J T. Acceptability of behaviour therapy for dental phobia. *Community Dent Oral Epidemiol* 2012; **40**: 1–7.
- Newton T, Naidu R, Sturme P. The acceptability of the use of sedation in the management of dental anxiety in children: Views of dental students. *Eur J Dent Educ* 2003; **7**: 72–76.
- Sturme P, Thomsett M, Sundaram G, Newton T. The effects of behaviour management, child characteristics and outcome on public perceptions of intervention acceptability in paediatric dentistry. *Behav Cogn Psychother* 2003; **31**: 169–176.
- McDonnell A, Dearden R, Sturme P. The acceptability of physical restraint procedures for people with learning disabilities. *Behav Cogn Psychother* 1993; **21**: 255–264.
- Sturme P. Treatment acceptability for anorexia nervosa: effect of treatment type, problem severity and treatment outcome. *Behav Psychother* 1992; **20**: 91–93.
- Newton J T, Hartley P H, Sturme P. Treatment evaluation for eating disorders by clients with eating disorders. *Behav Cogn Psychother* 1993; **21**: 371–374.
- Newton J T, Sturme P. Development of a short form of the Treatment Evaluation Inventory for the acceptability of psychological interventions. *Psychol Rep* 2004; **94**: 475–481.
- Newton J T, Nabeyama R, Sturme P. Internal consistency, factor structure and concurrent validity of the Treatment Evaluation Inventory. *Psychol Rep* 2007; **101**: 731–738.
- Anastasi A. *Psychological testing*. 4th edn. New York: Macmillan, 1976.
- Asimakopoulou K, Newton J T. The contributions of behaviour change science towards dental public health practice: a new paradigm. *Community Dent Oral Epidemiol* 2015; **43**: 2–8.