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Public awareness and social acceptability of dental therapists

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Abstract: *Objectives:* To investigate public awareness and the social acceptability of the use of dental therapists in dental care. *Method:* A telephone survey of a representative quota sample of 500 adults (>18 years of age) in South Yorkshire, England. *Results:* Fifteen per cent of participants were aware of dental therapists as a professional group, of whom only three people correctly identified their 'permitted duties'. Those without problems of access to care were more likely to report awareness ($P < 0.05$). Fifty-seven per cent were willing to receive simple restorative treatment from a therapist, with acceptability predicted by being younger [OR 1.016 (95% CI: 1.015–1.017)] and having a perceived need for treatment [OR 1.301 (1.053–1.607)]. Fewer were willing to allow a therapist to restore a child's tooth (47%, $P < 0.001$, test for paired proportions) with acceptability predicted by being younger [OR 1.016 (1.015–1.017)] and being an irregular attender at the dentist [OR 1.309 (1.138–1.697)]. Forty per cent of participants expected to pay less for treatment provided by therapists with the acceptability of equal costs predicted by having access to care [OR 1.346 (1.017–1.781)]. *Conclusion:* These findings have implications for the use of dental therapists. They question patients' and the public's ability to provide informed consent for the treatment provided by them and identify a need for education of the public on the training and competence of therapists and the rationale for employing skill-mix in dentistry.

Key words: acceptability; attitudes; dental auxiliaries; dental therapists; skill-mix

Introduction

The concept of a team approach in dentistry, where dental team members employ a spectrum of skills known as skill-mix, is now well established. Although its use varies internationally (1), the potential for increasing dental service access and efficiency by delegating care to dental auxiliaries has been recognized for some time (2–7). For example, it has been estimated that approximately 70% of all visits and 60% of all clinical time in a primary care setting could be provided by dental therapists (8).

Globally dental services employ a wide range of dental auxiliaries – most countries train and recognize dental hygienists, but far fewer train and recognize dental therapists (1). Although nomenclature and permitted duties vary, in addition to duties undertaken by dental hygienists, therapists are generally trained to undertake some or all of: simple restorations for children; pulp treatments and the extraction of deciduous teeth in children. Fewer countries, including the UK, permit dental therapists to provide simple restorations in adults.

In the UK there has been increasing emphasis on skill-mix (9, 10) with dental therapists now allowed to work in all sectors of dentistry (11). It is also proposed that all dental auxiliaries may undertake any duty provided that they have appropriate knowledge and professional competence to do so (12, 13). However, at present lists of 'permitted duties' that dental auxiliaries are usually trained to undertake are used as guidance. These changes have coincided with a step increase in the number of training places, where students are now trained as dually qualified dental hygienists and therapists.

There is often initial resistance by dentists to the use of therapists (14–17). However, where data exist, high levels of acceptance of dental therapists by dentists are reported once their use becomes established (18–20).

Surprisingly, little is known of the views of patients and the public on either the awareness or acceptability of their use. Although patients report satisfaction with a range of care provided by dental auxiliaries, including some simple restorative care (21–25), these data are of limited quality (26) and cannot necessarily be generalized to all countries.

Consequently, the acceptability of care provided by dental auxiliaries has been identified as an area for research (26). Quantitative patient satisfaction measures are often used to assess the views of existing service users on acceptability. However, if dental therapists are to increase service access and efficiency, the views of those who have not received treatment by a therapist are equally important, but could not be termed 'satisfaction'. Moreover, acceptability should be conceptualized more broadly. For example, views on the social acceptability or legitimacy of a service to its users and potential users (27) are regarded as key dimensions to be considered when assessing the quality of a service (27, 28). Similarly, the term social validity is used in the psychology literature where the social acceptability of the goals, procedures and outcomes of treatment are assessed (29–31). Conceptually, questions of social validity can be applied to services or professionals groups such as dental therapists. Therefore, the aim of this study is to investigate the public awareness and the social acceptability of the use of dental therapists in dental care.

Method

A telephone survey was undertaken by a market research company (GfKNOP, UK) using structured interviews on a representative quota sample (n = 500) of adults (18 years and over) in South Yorkshire, UK. Precision estimates were undertaken to calculate the desired sample size. These were based on data from pilot exploratory qualitative interviews which suggested that 20% of participants would be aware of dental therapists as a professional group. A sample of 500 would provide 95% confidence that the population proportion would be 20% ± 3.5%. This level of precision was regarded as sufficient for the study.

The content of the questionnaire was informed by a review of the literature, anecdotal reports and data from qualitative interviews (32). Areas of inquiry included: participants' age, sex, socioeconomic (33) and educational status; dental attendance patterns and access to care; perceived treatment need; awareness and knowledge of dental therapists and their 'permitted duties'; acceptability of treatment provided by therapists for adults and children and expectations of cost of treatment. Only closed questions were used. The questionnaire was piloted with 10 volunteers in face-to-face interviews in the first instance and with a further 20 by the market research company. There were minimal modifications requested.

Potential participants were then telephoned out of normal working hours by random dialling in postcodes to obtain a quota sample that was representative of the Office for National Statistics mid-2005 population estimates for South Yorkshire (34). The subject matter, purpose and likely duration of the survey were explained. Potential participants were informed that they could decline involvement in the survey at any stage during or after the interview. In achieving a sample of 500 participants, 575 declined participation, for each an appropriate replacement was called to ensure as representative a sample as possible. Having been asked the questions about demographic data and the duties of a dental therapist, all participants were

provided basic information about therapists indicating that they were professionally trained to undertake certain tasks once a dentist had examined the patient and prescribed particular treatments. All interviews took <5 min to complete.

The analytical strategy aimed to identify putative associations between independent variables and the four main outcome variables: awareness of therapists and their duties; acceptability of them providing treatment for the participant; acceptability of them providing treatment for children and the acceptability of the cost of treatment provided by therapists.

Data were entered into SPSS version 14 and analysed in two stages. Initially descriptive and appropriate bivariate analyses (chi-squared and Student's *t*-test) were undertaken to describe and compare key descriptor variables. The second phase aimed to identify independent variables that predicted the main outcomes variables. As the key difference between dental hygienists' and dental therapists' competencies is the provision of simple restorative care, willingness to have simple fillings performed by a therapist was used as an outcome measure of the acceptability of care provided by them. Bivariate analyses (chi-squared and Student's *t*-test) of the possible predictors of the acceptability of providing this treatment were used to preselect variables for forward stepwise logistic regression models. All variables with a relationship of $P < 0.2$ were entered into the models. The same process was employed to identify variables predicting the acceptability of treatment costing the same whether provided by a therapist or a dentist. The cut-off adopted for statistical significance was the 5% level. Ethical approval for the study was granted by the University of Sheffield, UK.

Results

Of the 500 participants, 245 (49%) were male, their mean age was 45.8 years and 32% had a child under 16 years of age. Seventy-one per cent attended regularly for check-ups and 26% perceived they had treatment need. Of those reporting difficulty with access to a dentist (13%), 54% cited a lack of availability of a National Health Service (NHS) dentist as the cause.

Overall, only 15% of participants were aware of dental therapists as a professional group. Significantly fewer participants who reported problems with access to dental care were aware of therapists compared with those without access problems (3.2% versus 16.7%, $P < 0.05$). Unsurprisingly, participants with relatives or friends who had worked in a dental team were more aware of dental therapists (42% versus 13%, $P < 0.05$). No other variables predicted awareness.

Table 1. **Participants' responses to questions on permitted duties of dental therapists**

Duty proposed	Proportion indicating that is a permitted duty (%)
Extract milk teeth for children	38
Give injections to make teeth and gums go numb	46
Carry out simple fillings for adults	55
Scale and polish teeth	88
Extract adult teeth	26
Give health education and prevention advice	88
Provide caps and crowns and bridges that stick permanently on teeth	30

Of those that had heard of a therapist ($n = 74$), only 28 (38%) thought that therapists were able to extract deciduous teeth and 46% that they could administer local anaesthetic (Table 1). Only three people correctly identified all of dental therapists 'permitted duties'.

For the purposes of further analysis, participants indicating that they were aware of dental therapists ($n = 74$) were dichotomized into two groups: those who correctly answered four or more of the questions on 'permitted duties' ($n = 22$) and those who did not. Following bivariate analyses, variables that potentially would predict knowledge of duties were then entered into a forward stepwise logistic regression model. No variable was found to predict knowledge of 'permitted duties' of a dental therapist.

Having received information on the role of therapists and their training, 57% of participants would be happy to receive simple restorative treatment and 87% to receive periodontal treatment and preventive advice. Seven per cent would not be happy to have any of these treatments (Table 2).

Overall, participants regarded dental therapists providing care for children as less acceptable (Table 3). Fewer participants regarded dental therapists providing fillings ($P < 0.001$,

Table 2. **Participants' views of the acceptability of treatment provided by dental therapists**

Treatment	Proportion willing to have treatment provided by therapist (%)
Carry out fillings	57
Scale and polish your teeth	87
Give you injections to make your teeth and gums go numb	64
Give you health education and prevention advice	87
I would not be happy to have any treatment from therapists	7

Table 3. **Participants' views of the acceptability of treatment provided by dental therapists for children**

Treatment	Proportion indicating that treatment acceptable (%)
Carry out fillings	47
Give injections to make teeth and gums go numb	48
Put preventive coatings on children's teeth	69
Extract children's milk teeth	44
Give health education and prevention advice to children and their parents	82

test for paired proportions), administering local anaesthetic ($P < 0.001$) and providing oral health education for children ($P < 0.05$) as acceptable than they did for themselves. Most participants found dental therapists extracting deciduous teeth to be unacceptable (Table 3). Forty-five per cent of participants expected to pay the same for treatment provided by dental therapists but 40% would expect to pay less.

Significant predictors of the acceptability of care provided by dental therapists and its cost are reported in Table 4. Younger participants and those with perceived treatment need were more likely to find having their tooth restored by a therapist acceptable. Younger participants and those who were irregular attenders were more likely to report a therapist restoring a child's tooth acceptable. Those who did not have problems with access to a dentist were more likely to accept paying the same (rather than less) for care provided by a therapist. Although there were varying levels of acceptability reported in different socioeconomic groups, chi-squared test for trends did not identify a clear association.

Discussion

To our knowledge, this study is the first to investigate the public's awareness and views on the acceptability of treatment provided by dental therapists. These data complement and triangulate with those from our qualitative study (32).

The low level of awareness of dental therapists reported here may reflect that such workers have previously only been employed in salaried dental services and few have been trained in the UK in the past two decades. Consequently, it is unlikely that participants will have encountered therapists in the past. Indeed, of those who claimed to have heard of a therapist, only three people correctly identified their 'permitted duties'; most (88%) suggested that therapists were able to scale and polish teeth and provide dental health education and prevention, whereas fewer than half suggested that they were able to administer local anaesthesia or extract deciduous teeth. This suggests that some of those who reported awareness of dental therapists as a professional group were confusing them with dental hygienists. Given the questions raised by the public and the profession about the suitability of the term 'dental therapist' to describe their roles and responsibilities (21, 32), this is perhaps unsurprising.

Experience of receiving treatment from dental hygienists may have also influenced participants' willingness to accept treatment from therapists; 87% were willing for them to provide scaling and polishing, prevention and health education advice, but fewer would accept simple restorative care or the administration of local anaesthesia (57% and 64% respectively). Qualitative data suggest that these procedures are perceived as more invasive and as such greater emphasis is placed on the importance of qualifications, familiarity and trust in their clinician (32). Younger participants were more likely to accept treatment from therapists, which indicates lower acceptance of skill-mix amongst older people, however the odds ratio (Table 4) indicates that 1.6% more people find dental therapists less acceptable for every year of life, so this effect is not strong. In general healthcare, although high levels of satisfaction with skill-mix have been reported (35–39), some older patients' have indicated a preference to see the doctor in certain circumstances (37). These factors will need to be

Table 4. **Forward stepwise logistic regression models for the predictors of the acceptability of care provided by dental therapists**

	Explanatory variables odds ratio (95% confidence interval)			
Dependent variable	Younger	Perceived need	Irregular attender	No access problem
Restore tooth	1.016 (1.015–1.017)	1.301 (1.053–1.607)		
Restore child's tooth	1.016 (1.015–1.017)		1.309 (1.138–1.697)	
Pay the same				1.346 (1.017–1.781)

Variables tested in models and not found to be statistically significant predictors of:
Acceptability of dental therapist restoring participant's tooth: Child in house under 16 years; dental attendance pattern; socioeconomic class.
Acceptability of dental therapist restoring child's tooth: Child in house under 16 years; socioeconomic class; access problems.
Acceptability of paying the same for treatment provided by a dentist and dental therapist: Sex; socioeconomic class; access problems.

considered when delegating care to dental therapists for older patients.

One potential of skill-mix is to increase access to care. Interestingly, having dental access problems was not associated with the acceptability of the use of dental therapists (Table 4). This finding warrants further attention as earlier studies have identified that that those who do not access care are often anxious of dental treatment (40, 41) and a possible link between dental anxiety and opposition to skill-mix has been reported (32). However, those who are unable to access care may wish for the dental workforce to be expanded. Further research is required on these two potentially conflicting positions.

Overall, dental therapists providing treatment for children were regarded as less acceptable than it was for adults. Fewer than half of participants indicated that they would be happy to allow a therapist to administer local anaesthesia, provide restorative treatment or extract deciduous teeth for a child (Table 3). These data are consistent with those from the qualitative part of the study (32). This finding is ironic given the key role for dental therapists in the treatment of children and adolescents. Indeed in New Zealand and Australia therapists predominantly work in the school dental services (42, 43). Dental politicians opposed to the use of dental therapists have emphasized concerns about non-dentally qualified team members treating children (15). If skill-mix is to be used to increase access to dental care, especially for children, these concerns will have to be considered. There will need to be careful communication with patients/guardians about the rationale for using dental therapists and reassurance about the quality of their training, their qualifications and competence (32), emphasizing the quality of care provided should be at least as good as that provided by dentists. Significantly, however, those who were younger were more likely to report dental therapists restoring a child's tooth as acceptable (Table 4).

Participants that reported attending the dentist irregularly were also more likely to be willing for their child to be treated by a dental therapist (Table 4). Bivariate analysis had identified that those who had access problems were more likely to find care provided by therapists for children as acceptable. However, it was not a significant predictor of acceptability in logistic regression, indicating some confounding with irregular attendance. This may reflect pragmatic acceptance of skill-mix in dental care (i.e. asserting that some care for children is better than no care), although this would benefit from further exploration.

Concerns have been expressed that using dental therapists may lead to a two-tier dental service, where access to a dentist for treatment would be reserved to those who could afford it (15, 32). These concerns reflect a consumerist rather than a public service view of dental care. The qualitative study identified that participants tended to perceive dental and medical services differently; those with a public service view of NHS general healthcare often had more consumerist views of NHS dental services as patient charges are levied whereas in general healthcare they are not (32). These findings are of particular significance in countries where private dental care predominates. Although there was no trend identified in the acceptability of paying the same for care from dental therapists and dentists across socioeconomic groups, those without access to care were more likely to expect to pay less (Table 4). This might be explained if the cause of their access problems is the inability or unwillingness to pay for their treatment in the first place and will need to be considered if skill-mix is to be used in areas where access is poor.

Contemporary approaches to healthcare quality emphasize the importance of lay views, and that they should go beyond mere evaluation of satisfaction with care received to consider the social acceptability of services (27). Donabedian's notion of social acceptability is closely related to the psychological concept of social validity (29–31). In both assessments of the social desirability and appropriateness of a service and its outcomes are required. Therefore, the views of those that have and have not experienced care are required if social acceptability is to be assessed. Taken together the quantitative and qualitative (32) data identify a number of barriers to the social acceptability of skill-mix in dentistry and the use of dental therapists in particular. There is a clear role for governments and the profession to communicate the rationale for using skill-mix (i.e. increased efficiency, effectiveness and access). Further, given the lack of awareness of the roles and duties of dental therapists, it is perhaps unsurprising that the reported acceptability of more invasive and irreversible treatments was low. In addition, if awareness remains low and skill-mix is increasingly employed to deliver care, it is questionable whether patients will be able to provide informed consent for their care to be delegated to therapists. However, our qualitative study suggests that once the public and patients understand the reasons for using skill-mix, they are more likely to regard it as acceptable (32).

Although every effort was made by the market research company to ensure a representative sample, a risk of sampling bias exists with telephone survey methods if response rates vary in different groups within the population. Although the impact of such potential bias is unknown, other methods (e.g. postal surveys) are prone to response bias for similar reasons, resulting in over-representation of the views of white

participants with higher incomes and educational attainment (44). Telephone surveys have been used in national dental surveys (45) and remain an important method of choice for public health and social surveys in seeking the population's views, particularly in North America (46–48). As this study was undertaken in the UK the generalizability of these findings to other countries is unknown. It is likely that the low level of experience of being treated by therapists will have influenced the levels of awareness and knowledge of their duties.

The quantitative and qualitative (32) elements of this study have identified a number of other areas for future enquiry. First, research is needed into service users' views on the broader aspects of the quality of care received from dental auxiliaries and what factors influence these views. This should include investigation of adults', parents'/guardians' and children's views on the experiential acceptability of care provided by auxiliaries. Because of the theoretical and methodological difficulties in so doing (49, 50), mixed-method approaches should be considered (51, 52). Also models of how to employ skill-mix in public and private sector services should be explored and developed, including how to best communicate the delegation of care in both.

Conclusion

This study identified that awareness of dental therapists and their permitted duties was low. Although acceptability of some procedures was relatively high, more invasive procedures were regarded as less acceptable. Overall, dental therapists providing care for children were regarded as less acceptable than it was for adults. Common predictors of acceptability were participants who were younger, if they perceived they needed treatment and if they attended the dentists irregularly. Paying the same for treatment performed by dental therapists and dentists was acceptable to fewer than half of participants and was more likely amongst those who had access to care. These findings have implications for the delegation of clinical care and the promotion of skill-mix in dentistry.

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