Abstract

Objective: Shared decision-making (SDM) involves patients as equal partners in decisions about treatment. This study aimed to establish UK orthodontic treatment providers' knowledge of, and attitudes to, SDM.

Design: Cross-sectional survey.

Setting: Online survey across the UK.

Population: Dentists and orthodontists providing orthodontic treatment in the UK.

Methods: Potential participants were contacted through the British Orthodontic Society mailing lists. An online survey was developed to examine knowledge of, and attitudes to, SDM using a combination of evidence-based statements and free text boxes. Questions regarding previous training in SDM and preferences for further training were also included.

Results: The survey was completed by 210 respondents, yielding an approximate response rate of 15%. Respondents were mainly consultants (34%) and specialist orthodontists (42%). SDM was well described in terms of the people involved in this process, how it is approached, the components and topics of discussion, and the overall purpose of SDM. Generally there was consistency in attitudinal responses, with the largest variance in responses to questions about the professional-patient partnership, the interface between SDM and clinical guidelines and accepting a decision that is discordant with the professional's opinion. Fifty-one respondents reported having some previous teaching/training in SDM, with the majority (87%) indicating that they would like more training.

Conclusions: Clinicians providing orthodontic treatment in the UK have a good understanding of the meaning of shared decision-making. Concerns raised about using SDM and knowledge gaps suggest there is value in providing SDM training for the orthodontic team and that orthodontic providers would welcome it.

Introduction

Shared decision-making (SDM) is the process of involving patients as equal partners in making decisions about their care. SDM requires adequate knowledge, motivation and engagement from all decision-makers (Da Silva, 2012). Patients are experts in the impact of the condition on their everyday life, the values and preferences that underpin their choices, and their personal circumstances that may influence treatment success. Professionals are experts in diagnosis, the treatment options, the evidence base and the healthcare system. Professionals also have a crucial role in instigating and promoting SDM through inviting participation and providing information that will facilitate meaningful discussion.

SDM has been shown to have a number of potential advantages for delivering high quality care including improvement in patient knowledge, greater involvement and satisfaction with care, reduction in complaints, increased adherence to the selected treatment and greater self-care, improved health outcomes and more effective use of resources (Coulter & Collins, 2011; Da Silva, 2012; NHS England, 2018). Although beneficial and widely promoted by policy makers, many current healthcare systems have not yet fully integrated SDM into routine patient care (Elwyn, 2017). One key barrier to SDM identified in medicine is professional awareness and attitude to SDM, including the belief that SDM is already happening (Légaré et al., 2008; Pollard et al., 2014; Joseph-Williams et al., 2017). Informed consent is often considered to constitute SDM but although both share common steps, such as provision of information and an element of choice, SDM is differentiated by incorporating patient preferences and greater deliberation in the decision-making process (Kunneman & Montori, 2017).

Attitudinal issues have been found to affect SDM amongst medical professionals include (Légaré & Witteman, 2013; Légaré & Thompson-Leduc, 2012; Pollard et al., 2014; Légaré et al. 2008; Gravel et al. 2006). The first is a general mistrust in SDM as a whole, resulting from the belief that SDM may threatens professional autonomy, cause uncertainty, abandon the patient to choose treatment alone and lead to pressure on professionals to deliver treatment that is not clinically appropriate. Professionals also report a belief that SDM does not apply to characteristics of certain patients or clinical situation or that it is difficult to do and will not make a difference to outcome. Furthermore, there is a perceived inadequacy in training and resources to support SDM and often concerns about a lack of time and other organisational barriers.

A recent study of healthcare professionals across six medical disciplines in the USA found a positive attitude to SDM despite a low level of knowledge (Forcino et al, 2018). To date, the knowledge of and attitude of dental professionals specifically to SDM has not been examined in the UK. SDM is part of the larger concept of "patient centred care" and there is some work in this area. A qualitative study examining dentists' attitudes to patient-centred care in a UK dental school found important principles were recognised, such as holistic care with patient involvement; however, there was evidence of paternalism, concerns about unrealistic patient expectations and perceived conflict between clinician and patient choice (Scrambler et al. 2015). The authors highlighted that the majority of respondents had little or no formal training in patient-centred care and recommendations were made to embed the theory of patient-centred care into the undergraduate curriculum; however, it may be too early to assess whether this has made an impact.

The current study aims to address this gap in the literature and to provide evidence about current knowledge and attitudes in orthodontics; this is an important first step for identifying training needs and barriers that may prevent integration of SDM into routine clinical practice. This research will inform future work to encourage and support providers of education in dentistry to deliver innovative SDM training programmes.

Aim

To establish UK orthodontic treatment providers' knowledge of, and attitudes to, shared decision-making (SDM).

Methods

The study was a cross-sectional online survey. Ethical approval was obtained from the University of Leeds Dental Research Ethics Committee prior to data collection (DREC 070619/SB/276). The study was conducted in accordance with the ethical principles outlined in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. The study was designed, conducted and reported using best practice guidance (Burns et al. 2008; Kelley et al. 2003) and in accordance with the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) (Eysenbach, 2004).

The population of interest for the study was dentists and orthodontists providing orthodontic treatment in the UK. The eligibility criteria are shown in Table 1.

An online survey was developed to ascertain 1) Understanding of the term SDM and attitude to SDM using a 4-point scale for agreement with attitudinal statements; 2) Knowledge of SDM based on evidence-based statements; 3) Self-reported teaching or training in SDM; 4) Preferred approach to clinical decision-making; 5) Anonymous demographic information (sex, job role, main place of work, year dental/orthodontic qualification obtained).

The process for developing the survey is shown in Table 2. The survey was developed using the content of questionnaires used in previously published studies to measure awareness and attitudes to SDM (Durand et al., 2017; Forcino et al., 2018). Durand et al. (2017) developed a questionnaire for use with medical students using published literature and focus groups, which was subsequently piloted and modified. The questionnaires included clinical scenarios written by a medical student and then refined by SDM experts, including clinicians. The Four Models of the Physician-Patient Relationship (Emanuel & Emanuel, 2017) were the basis for the options in the clinical scenarios. In the second study, Forcino et al. (2018) modified this medical student questionnaire for use with a broad range of healthcare professionals. In the present study, the questionnaire was considered alongside other SDM literature regarding awareness and attitudes to SDM and scenarios were adapted to be relevant to orthodontic professionals. The survey was piloted with ten respondents from the target population and feedback was used to modify the survey. This included adding an '*I don't know'* option to the knowledge questions to reduce the chance of respondents guessing. A copy of the survey is given in the supplementary material.

The survey was distributed to members of the British Orthodontic Society (BOS) via email invitation using mailing lists and permission to contact members via email was granted by the BOS Research Directorate. BOS membership groups that were contacted included the Training Grades Group (TGG) (approximately 210 members), the Orthodontic Specialist Group (OSG) (approximately 730 members), the Practitioner Group (PG) (approximately 300 members), the Consultant Orthodontist Group (COG) (approximately 340 members) and the Community Group (approximately 20 members). It was noted that some people are members of more than one group and some email addresses would not deliver the email; hence the percentage response provided in the results is approximate. A covering email was sent with an explanation of the research and a link to the survey. One reminder email was sent after 2 weeks.

Consent to participate in the survey was indicated by completion of the survey. Participants were able to withdraw at any time by exiting the survey. A small monetary incentive in the

form of vouchers for a department store was offered to encourage participation. Data were collected using Jisc Online Surveys and collated in Microsoft Excel v16.23 for analysis.

Data analysis included:

- Description of the characteristics of the sample: gender, main job role, care setting, year of orthodontic / dental qualification, previous teaching / training in SDM
- Frequency of responses (%) for attitudinal and knowledge questions
- Framework analysis of participants' understanding of the definition of SDM and perceived differences in decision-making approaches

Results

The survey was open from 18th November to 18th December 2019. Two hundred and ten responses were received, giving an approximate response of 15%. Response validity was checked based on straight lining (i.e. respondents providing the same answer to all questions) and minimum time taken complete the survey. No responses were judged to require exclusion. The median time taken to complete the survey was 10.5 minutes.

Characteristics of the sample

The sample was 51% female and 49% male. The majority of respondents worked in more than one setting and were either a Specialist Orthodontist or Consultant (Table 3). Respondents' year of qualification from either orthodontic or dental training is shown in Figure 1.

Attitude to SDM

Table 4 shows the framework developed to explain what SDM meant to respondents in their own practice. SDM was described in terms of the people involved, how it is approached, the topic of discussion and components within this, and the overall purpose of SDM. Four respondents indicated that SDM was not a concept they were familiar with. Other definitions of SDM that did not fit with the framework and are not generally considered part of SDM included:

- People with responsibility for a patient who may not be fully competent to give consent acting in the patients best interest
- Seeking second opinions

- Sharing between professionals
- Discussing diagnosis or treatment planning with a similar or more qualified clinician
- Involving practice staff in daily decisions

Responses to attitudinal questions relating to SDM are given in Figure 2. Generally there was consistency in responses, with differences in the strength rather than direction of agreement/disagreement. There was most difference in whether respondents agreed/disagreed with statements relating to the professional-patient partnership ('*Shared decision-making is challenging because patients ask me to decide for them*' and '*Shared decision-making may cause patients to question my clinical expertise*'), the interface between SDM and clinical guidelines ('*Shared decision-making is not always compatible with clinical guidelines'*) and accepting a decision that is discordant with the professionals opinion ('*It is alright for a shared decision to stray from what I feel is the most clinically appropriate course of action'*). This is supported by the free comments given about attitudinal questions (Figure 3).

Knowledge of SDM

Responses to knowledge questions are given in Figure 4. The vast majority of respondents (94%) were aware of the benefits of involving patients in terms of enhancing knowledge. The results suggest there is least knowledge about the evidence around the effect of SDM on decisions about invasive or complex treatment, adherence to treatment and health outcomes. The free comments identified respondents perceived lack of knowledge around SDM due to a lack of high quality studies providing good evidence, a lack of familiarity with outcomes and evidence base for SDM and the variety of names and definitions used for similar concepts, which make it challenging to combine evidence sources.

Approach to decision-making

When asked how decision-making should be approached in orthodontics, the most popular answer was a collaborative approach where the clinician and patient share responsibility (48%). Approximately a third of respondents (32%) felt the patient should make the final decision after seriously considering the professional's opinion. The least popular answers were an autonomous approach, where the patient makes the final decision and the professional's role was not stated (12%), and paternalistic, where the clinicians makes the final decision after considering the patient's opinion (8%). Free text comments highlighted that some respondents felt that as clinicians are responsible for the treatment provided they

should not be made to provide a treatment they feel is unwise and they have the reserve right to refuse, while others emphasised that ultimately the choice of treatment is up to the patient.

The Four Models of the Physician-Patient Relationship (Emanuel & Emanuel, 2017) provided the options for choosing a preferred approach to decision-making in a clinical scenario. An informative approach ('*Use evidence-based information to help the patient understand his health condition and all possible treatment options so he can decide on a treatment plan based on his values*') was the most popular response (57%), followed by a deliberative approach ('*Discuss the patient's health-related values with him and deliberate together using evidence-based information to decide on his treatment plan'*) (28%), then interpretive ('*Help the patient understand his personal values and suggest evidence-based treatment options that fit those values*') (15%). The paternalistic approach ('*Determine the patient's clinical situation independent of his values and present him with evidence supporting my treatment decision'*) was selected least frequently (0.5%).

One hundred and five respondents reported working in more than one setting. Of these respondents, 25 (24%) felt they approach decision-making differently in different settings. The reasons given are summarised in Figure 5 and largely related to the care setting involved, the patient populations and the treatment options available.

Teaching or training in SDM

Fifty-one (24%) respondents reported having some previous teaching/training in SDM, while 134 reported no previous teaching/training and 25 were unsure. The majority (98%) of those who had reported previous teaching/training stated this was as a postgraduate or within continued professional development; most commonly as online learning, a workshop, or mixed format. Only one person reported receiving undergraduate teaching in SDM.

The majority (87%) of respondents indicated they would like more training in SDM. Of the 26 respondents who did not want further training, six people (23%) felt they already know enough about SDM, 19 (73%) reported they are already using SDM in everyday practice, and inadequate time or funding within their personal development plan was reported by one (4%) and four (15%) respondents respectively.

Discussion

A good general understanding of the key principles of SDM was demonstrated, namely that it is a collaborative, supportive, person-centred process that promotes discussion and

deliberation between patients and professionals. A collaborative approach was the favoured approach in orthodontics; however, while most respondents indicated a patient-professional partnership was preferable, whether to enact this through a deliberative, informed or interpretative approach was more variable. Differing opinions on how patient-professional collaboration is delivered may explain why and, although most attitudinal questions were answered favourably, concerns were raised about SDM. The most common concerns were the perceived limitation to clinicians' freedom to select or refuse treatment, challenges in applying both SDM and clinical guidelines simultaneously and the ability and willingness of patients to participate. This reflects concerns expressed in other areas of health care (Pollard et al., 2014; Légaré & Witteman, 2013; Légaré & Thompson-Leduc, 2012; Légaré et al. 2008; Gravel et al. 2006) and arguably these concerns reflect lack of full implementation of SDM rather than a fundamental disagreement with the concepts underpinning SDM.

Discussing all options for treatment, their relative advantages and disadvantages based on the evidence and the patient's individual circumstances does not mean all options are suitable and must be offered. Instead the discussion should actually highlight why some options are not suitable and explain why certain options are not being offered, thus hopefully reduce dissatisfaction associated with the perception that treatment options have been withheld. Evidence-based practice embodies both the use of clinical guidelines and inclusion of patient preferences equally, so where there is conflict between the two it is important to identify the underlying reasons why a patient may wish to choose a treatment option which is not judged to be the most effective. This will help to identify misunderstanding or perceptions that patient values have not been adequately considered in the decision-making process. Finally, if patients are not willing or able to engage in care choices, this raises the question as to whether treatment is appropriate, whether more needs to be done to support effective communication and engagement, and whether it will ultimately be possible to obtain valid consent.

The second area of concern focussed on the challenge of effectively delivering SDM within the current system. When planning future interventions in any existing healthcare system it is important to consider what is currently working, what changes are needed, and what can be revised or removed to make space for these changes. Some survey respondents indicated that they felt for the majority of orthodontic care, effective decision-making is routinely occurring. This suggests that there is value in mapping how SDM is currently used, potential barriers to, and facilitators of, SDM and which decisions, populations and contexts present challenges for SDM.

It appears that there is a desire for further teaching or training in SDM and clinicians identified knowledge gaps in certain areas. The NHS White Paper "Equity and Excellence: Liberating the NHS" (2010) promotes SDM and greater patient involvement in choices, yet currently there is little undergraduate and postgraduate training in SDM compared with other important clinical skills. Courses incorporating SDM largely focus on communication and informed consent rather than on the principles underpinning SDM and practical skills for implementing personalised health care.

This survey has provided useful foundation information for future research and education in SDM in orthodontics, however, limitations in the study that may have introduced bias must be acknowledged. Firstly, the sample was a convenience sample of BOS members and the percentage response was low . This means that there is potential for selection, non-response and volunteer bias. It was not possible to compare the demographics of respondents with those of the overall BOS membership due to anonymity of responses. The lack of published data on the number and characteristics of UK orthodontists and BOS members meant the potential effect of the sampling approach could not be quantified. These potential biases in the study population may affect the representativeness of the sample and reduce the external validity of the survey. As a result, it is important that the results are taken as an initial exploration of opinions on this topic with recognition that the study may overestimate the favourability of attitudes, knowledge of SDM and the demand for further training in SDM. Secondly, while the questionnaire was developed from previous studies and piloted, the format and wording of questions may have allowed some response bias if respondents were able to guess the 'desirable' answer. Thirdly, closed questions surveys are a relatively limited approach for measuring attitudes and knowledge. The addition of free text boxes allowed for a nuanced response to question and the added information gained from these comments highlights that a more in-depth examination of SDM in orthodontic practice is warranted.

Conclusions

- Clinicians providing orthodontic treatment in the UK have a good understanding of the meaning of shared decision-making.
- Concerns raised about using SDM and knowledge gaps suggest there is value in providing SDM training for the orthodontic team and orthodontic providers would welcome it.

Tables and Figures

Table 1: Eligibility criteria for survey

Table 2: Method for developing the online survey

Table 3: Workplace and main job role of survey respondents

Table 4: Framework developed to explain what SDM means to respondents in their own practice

Figure 1: Year orthodontic qualification was obtained. For non-specialists, this was year of dental qualification. (NB. Not all respondents answered the question)

Figure 2: Responses to attitudinal questions

Figure 3: Free text responses arising from the attitudinal questions

Figure 4: Responses to knowledge questions

Figure 5: Respondents' explanation for differing approach to SDM in different care settings.

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Table 1: Eligibility criteria for survey

Inclusion	Exclusion
Dentists and orthodontists providing orthodontic treatment in the UK including: ▪ Primary and secondary care orthodontic specialists ▪ Consultant orthodontists ▪ General dentists providing orthodontics ▪ Orthodontic specialty trainees	General dental practitioners who do not provide any orthodontic treatment Specialists in other areas of dentistry Non-dental professionals People providing orthodontic treatment outside the UK

Table 2: Method for developing the online survey

Stage		Methods
1	**Development of content**	▪ Examination of content of questionnaires used in previous studies (Durand et al. 2017, Forcino et al. 2018). ▪ Review of SDM literature to identify any other attitudinal and knowledge measures. ▪ Item selection by expert panel (SC, FR, SB).
2	**Survey development**	▪ Survey design. ▪ Programming by researcher (SB) into Online Survey.
3	**Testing**	▪ Pre-testing with ten respondents from the target population to assess face validity, usability and functionality. ▪ Modification as required.

Table 3: Workplace and main job role of survey respondents

			n	(%)
Setting	Single setting	Armed forces	1	(0)
		Community	5	(2)
		General practice	11	(5)
		Hospital	54	(26)
		NHS practice	19	(9)
		Private practice	9	(4)
		University	1	(0)
	Mixed setting	Primary care	46	(22)
		Primary and secondary	64	(30)
Main job role	Academic		1	(0)
	Dentist with Special Interest in Orthodontics (DWSI)		20	(10)
	Specialist Orthodontist		88	(42)
	Consultant		72	(34)
	Pre-CCST trainee		18	(9)
	Post-CCST trainee		11	(5)

Table 4: Framework developed to explain what SDM means to respondents in their own practice

People involved	Patient	Patient; Parent; Guardian; family; carer; other important people
	Professional	Professional; clinician; orthodontist; specialist; MDT; GDP; team; peers; staff
Approach	Collaborative	Discussion; involvement; engagement; jointly; teamwork working together; equal involvement; consensus; partnership
	Supportive	Informing; guiding; no pressure; enabling; patient; understanding; balance; reasoning; respecting; autonomy; patient ultimately makes final decision
	Process	Process; back and forth
	Person-specific	Specific; individual; patient-centred; tailoring; prioritising
Topic	Treatment options	Available; all; feasible; deliverable No treatment
	Focus	Health; Decision-making; Tests; Oral health care; Care; disease; condition
Components of discussion	Patient	Social factors / circumstances; Preferences and values; Goals; Needs; Patient wishes; Attitudes; Concerns; opinion; input; expectations
	Professional	Clinical factors; Recommendations; Best evidence; Pros and cons / risks and benefits; Advantages / disadvantages; Opportunities and consequences; Answer questions and clarify
	Tools	Leaflets; aids; time; communication
Purpose	Patient-centred	Empower; Ownership; Helping patient choose best option for them Jointly agreed aims Best solution
	Outcome-related	Choose clinical pathways that suit individual need Improved compliance; Improved outcomes
	Consent	Fully informed consent; Informed decision / valid consent; More than consent; shared responsibility