

Shared Decision Making in Scaling and Root Planing

José Verdugo, Lory Laughter, David W. Chambers

Intended journal: *Journal of Dental Education*

Draft of 21 April 2022

ABSTRACT

Purpose/Objectives: Estimate the patient participation in decisions commonly arising in scaling and root planing as functions of the professionals' preferences of dental hygienists, typical situations in this procedure, common approaches to patient interaction, and the interaction of these factors.

Methods: Survey of graduates and students in a baccalaureate dental hygiene program.

Results: Paternalism (tell and do) and informed consent (give choices and reasons and ask for permission) were more common than shared decision making (discuss alternatives, solicit patient input, and arrive at a mutual decision) and declining (patient declines or avoids further involvement) across selecting treatment, procedural options, financial arrangements, and homecare follow-up. Dental hygienists exhibited a wide range of personal approaches and use of shared decision making decreases with length of practice.

Conclusions: Attempts should be made to determine whether the degree of patient participation in decisions regarding their treatment affect oral health outcomes, especially through seeking care in the first place and following recommendations for behavior outside the office. Factors of office procedures and policy may account for so-far unexplained variation in patient participation.

1 INTRODUCTION

Shared decision making (SDM) is an approach to reaching agreement on patient care introduced in the 1982 report of the *President's Commission for the Study of Ethical Problems in Medicine and Biomedicine and Behavioral Research in Making Health Care Decisions*. It was stated there, "Shared decision making requires that a practitioner seek not only to understand each patient's needs and develop reasonable alternatives to meet those needs, but also to present the alternatives in a way that enables patients to choose one they prefer." ^{1 p. 44} The intent has been to promote greater participation by patients on the grounds of ethical standards and better health outcomes.

There has been an extensive conversation in the medical literature regarding the nature of SDM, ² how best to define ³⁻⁵ and measure it, ⁶ its impact on health outcomes, ⁷ and means of promoting it. ⁸ The latter includes a distinct areas of study exploring standardized instructional materials known as patient decision aids (PDAs). ⁹ A PubMed search on "shared decision making" at the beginning of 2022 returned more than 16,000 citations. A review by Chambers ¹⁰ found that there is yet to be consensus on the operational definition of SDM or how to measure it and that there is almost no evidence that it is widely implemented or that it leads to predictable health improvements. A recent systematic review by Elwyn and colleagues ¹¹ reported that current research continues to use a concept where exchange is dominated by the care provider with care providers presenting science-based treatments and patients accepting those most closely agreeing with their values. All research has been conducted in the professional's offices.

The current literature on SDM in dentistry is much smaller, comprising only 34 articles (2-tenths of a percentage of the total field). The plurality of these papers (14) are introductions of the concept rather than data-based studies. A further 5 develop arguments that SDM is a form of evidence-based practice or informed consent and 2 are systematic reviews. Three papers report that dentists feel they use SDM,¹²⁻¹⁴ while five found that dental patients want more participation in decisions regarding their care.¹⁵⁻¹⁹

Scaling and root planing is a well-defined procedure (CDT code D4341, D4342) normally performed by dental hygienists across appointments. There are predictable decision points such as whether to perform the procedure, various procedural choices such as use of anesthetic or number of appointments, homecare adjuncts, and payment. At each of these decision points there is opportunity for varying degrees of patient participation in determining what will happen next.

In this paper, SDM will be defined as two autonomous and uncoerced agents both committing to actions that neither has reason to want to change given their understanding of the situation at hand and of the intended actions of the other party.²⁰ In line with the origin of the concept, SDM can be viewed as a point on a continuum across levels of patient participation.

In some cases, the patient has almost no role. This traditional or *paternalistic* approach involves the dental hygienist proceeding with the one path deemed most appropriate. The patient is usually told what will happen next and often a reason is added. "I am giving you a rubber-tip instrument that I want you to use every day to massage your gums to increase blood circulation."

A greater degree of patient participation is involved in *informed consent*. Here alternative paths are presented, along with the advantages and disadvantages of each, and permission is sought from the patient. "This rubber tip instrument will make your mouth healthier because it increased blood flow. I think without it, you may continue to experience gum problems. Do you think this is something you are interested in trying?"

SDM recognizes the patient as a source of information, capability, and personal preferences. It is not an abdication of the dental hygienists' responsibilities but a pooling of information with a goal of arriving at a mutual understanding of what approach to care is best considering input from both the oral health professional and the patient. The patient says in response to the informed consent presentation, "Of course I want to have a healthy mouth. But I have tried these things before and, honestly, I don't have the skill or motivation. I will try it if you agree to phone me in a week so we can talk about my progress and you can show me an improvement."

There is a fourth level of patient participation that is often overlooked. This might be described as *declining*, where the patient withdraws. In the case of the offered rubber tip aid, passive dismissal might be signals if the patient simply says, "Sure." Declining is more common than assumed because patients often mask it with polite words or silence during the appointment and simply fail to follow through once outside the office.

The purpose of this research was to form an estimate of the proportion of standard decisions in the scaling and root planing procedure and to determine whether there are factors such as the nature of the decision and approach – paternalism, informed consent, SDM, and declining – associated with participation. An estimate was also made of the extent to which differences could be attributed to characteristics of dental hygienists.

2 MATERIALS AND METHODS

This project was approved by the Institutional Review Board at [name redacted during review] in the exempt category, 22-021.

A digital survey was administered (Google Forms) using the questions shown in Table 1. The survey was pilot tested using dental school faculty members and the format was modified based on the advice of the statistician in order to improve testing and interpretation of input.

Four dental hygienists were invited to participate. This included 336 graduates from 2005 through 2020 and 64 current students in the baccalaureate program at [name redacted during review]. The survey was open for 2 weeks in March of 2022 and a single reminder was sent after 1 week.

Variables captured included: (a) current practice location and years of practice, (b) estimates of proportion of scaling and root planing patients receiving each of four approaches to participation (paternalism, informed consent, SDM, and declining), (c) across four situations (scaling and root planing treatment, procedure aids, financial arrangements, and homecare instruction), and estimates of no-show or cancellation and postponing of in multiple-appointment procedures.

In addition to descriptive statistics, one-way ANOVA tests with Scheffé post hoc analysis and 3-factorial fully-crossed ANOVA were performed. Measures of effect were estimated using generalizability analysis²¹ and regression analysis.

3 RESULTS

The overall response rate was 15%. This included 58 individuals, broken down as 40 dental hygienists in private practice, 13 students, and 5 self-identified as teaching or employed in a clinic serving reduced or no-pay patients. Average current days in practice was 3.1. The number of respondents was sufficient to detect existing differences and there is no reason to expect reporting bias due to social desirability.

Figure 1 shows the distribution of approaches across the 4 situations studied. The reports are expressed as respondents' estimate of percentages in each category. Generally, across these situations, paternalistic and informed consent approaches are more common than SDM or patient control through declining engagement. These trends are confirmed statistically, as shown in Table 2. The one-way ANOVAs across approach are all significant at $p < .001$, with Scheffé post hoc contrasts (at $p < .05$) always grouping paternalism and informed consent in a high frequency group and SDM and declining cases in a low frequency group. The same general picture also characterizes financial decisions allowing for the fact that almost half of the cases are referred to the front desk.

Three-factorial ANOVA was performed to identify the relative contribution of (a) dental hygienist, (b) situation, and (c) approach and the potential for interactions among these factors. The statistical analysis is reported in Table 3. There were highly significant contributions made by dental hygienist, across approaches, and with interactions between dental hygienists and approach and dental hygienists and situation. Cronbach's generalizability analysis was performed using these data in order to partition the total 100% of variance across sources. This is shown in the right-hand column in Table 3 and graphically in Figure 2. In the figure, the size of the circles and interaction segments are proportional to percent variance, and interactions are represented by intersections among circles.

Effect of years in practice on SDM is displayed in the scattergrams in Figure 3. This graph shows the wide range of responses across dental hygienists on the vertical axis. Dental hygienists with less likely to use SDM in all situations except for financial arrangements. This can be seen in the negative slope of the regression lines in the figure which in combination exceed significance at $p < .05$.

Dental hygienists reported on overall patient follow-through on multiple-appointment procedures. Postponements and cancellations were estimated at 23.3% (SD = 15.7) and lost patients were estimated at 18.9% (SD = 15.6).

4 DISCUSSION

Students and graduates of the baccalaureate dental hygiene program at [redacted during review] reported that the proportion of decisions during scaling and root planing procedures strongly trended toward paternalistic and informed consent approaches. Use of SDM was significantly less common, and direct awareness of patients declining participation was not commonly recognized. Substantial variation was reported across dental hygienists, and SDM was reported to decline with years of practice. Patient disengagement from participation in treatment may be underestimated in the case of financial arrangements where the decision is less likely to take place at chairside and in general as the postponement, no-show, and lost patients for multiple-appointment procedures was estimated in the 20% range.

It is difficult to place this research in the general context of SDM findings in medicine. Most empirical work there has focused on characterizing SDM approaches. The number of reports of how common SDM is small and mixed. There are no studies reporting SDM as a function of care providers, with the emphasis being on whether care seekers “appreciated” SDM when used.

One reason that paternalism and informed consent are “over-reported” is that oral health professionals focus their attention on those health decisions that are made in the office. Much of the effect of oral health is the results of choices made outside the office. These include diet, homecare practices, access to financial resources, and critically, whether one will go to the office in the first place.

Much has been made of evidence-based dentistry in recent years. The idealized intersection of literature, dentists’ knowledge and patients’ values is well-known.²² It is a theoretical abstraction. Research is needed to determine the actual shape, size, and overlap of the factors in oral health care represented by the circles. The way oral healthcare professionals practice is determined by more than the knowledge they have gained from practice (or the literature). Professionals are motivated by the knowledge, skills, and values they have. These three elements are explicitly enumerated in the accreditation standards for dental hygienists under the definition of competency.²³ The research reported here suggests that what directs dental hygienists’ presentations to patients goes beyond the “literature.” The same is true for patients. They bring more to the engagement, both in the office and outside, than their values. A patient may ask, “Why are you taking x-rays when I just had some a week ago at the doctor who referred me here?” or “I know the things you are showing me are good for me and perhaps younger patients might do that, but I have tried it before and I just can’t manage.” It is the combination of knowledge, skills, and values that matter.²⁴ The range of motivating factors for both care seekers and care providers is large. That suggests the wisdom of two approaches: First, SDM is the optimal way of working out the mutually most effective interaction between professionals and patients.²⁰ Second, research is needed to describe the actual shape of the interaction between dental hygienists

and patients. Policy, the attempt to find one size that fits all, may serve other practice needs but not be optimal for oral health care.

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Table 1 Survey of patient participation in decisions regarding scaling and root planing.

_____ Year of graduation

_____ Current days of work per week

Primary practice setting: private office health care clinic teaching student

For this survey we ask you to reflect back on your experience with patients needing **scaling and root planning**. In each case, express your responses in terms of percentage. Because the categories are meant to be mutually exclusive, your estimated percentages should total to 100% for each question.

A. Treatment: Your examination of the patient led you to believe that the best treatment alternative was S&RP

- I inform the patient, with relevant reasons as necessary, and then we proceed
- I present both positive and negative effects of proposed actions, there is a two-way discussion, with questions, and upon agreement, we proceed
- Patient raises questions and I provide information, but patient still seems reluctant to proceed
- Patient declines treatment or postpones it with no follow through

B. Procedure: Use of local anesthetic, one or two appointments, etc.

- I inform the patient, with relevant reasons as necessary, and then we proceed
- I present both positive and negative effects of proposed actions, there is a two-way discussion, with questions, and upon agreement, we proceed
- Patient raises questions and I provide information, but patient still seems reluctant to proceed
- Patient declines treatment or postpones it with no follow through

C. Financial Arrangements

- I proceed without discussing finances
- I present the dollar amount of the fee and patient accepts or acknowledges what is presented and I proceed
- Patient raises concerns over fee and asks about alternatives
- Patients are referred to the front desk and return for treatment, either at that point or after scheduling a new appointment
- Patients are referred to the front desk, but they do not follow up

D. Homecare: Fluoride Varnish, other aids

- Patient is informed of available and appropriate home aids, and following presentation, believably commits to follow-through as demonstrated on follow-up visit

_____ Patient is informed of available and appropriate home aids and engaged in conversation, mentioning both previous experience and potential barriers

_____ Patient is informed of available and appropriate home aids, but says nothing and no sign of interest beyond perfunctory agreement

_____ Patient is not informed of available and appropriate aids, except in special cases

E. General patient follow through

_____ What percentage of patients did not follow through on multi-appointment treatment?
Subsequent no-shows

_____ What percentage of patients postponed or required rescheduling for multi-appointment treatment?

Figure 1 Frequency distributions of reported approaches to patient participation in four decision situations in scaling and root planing.

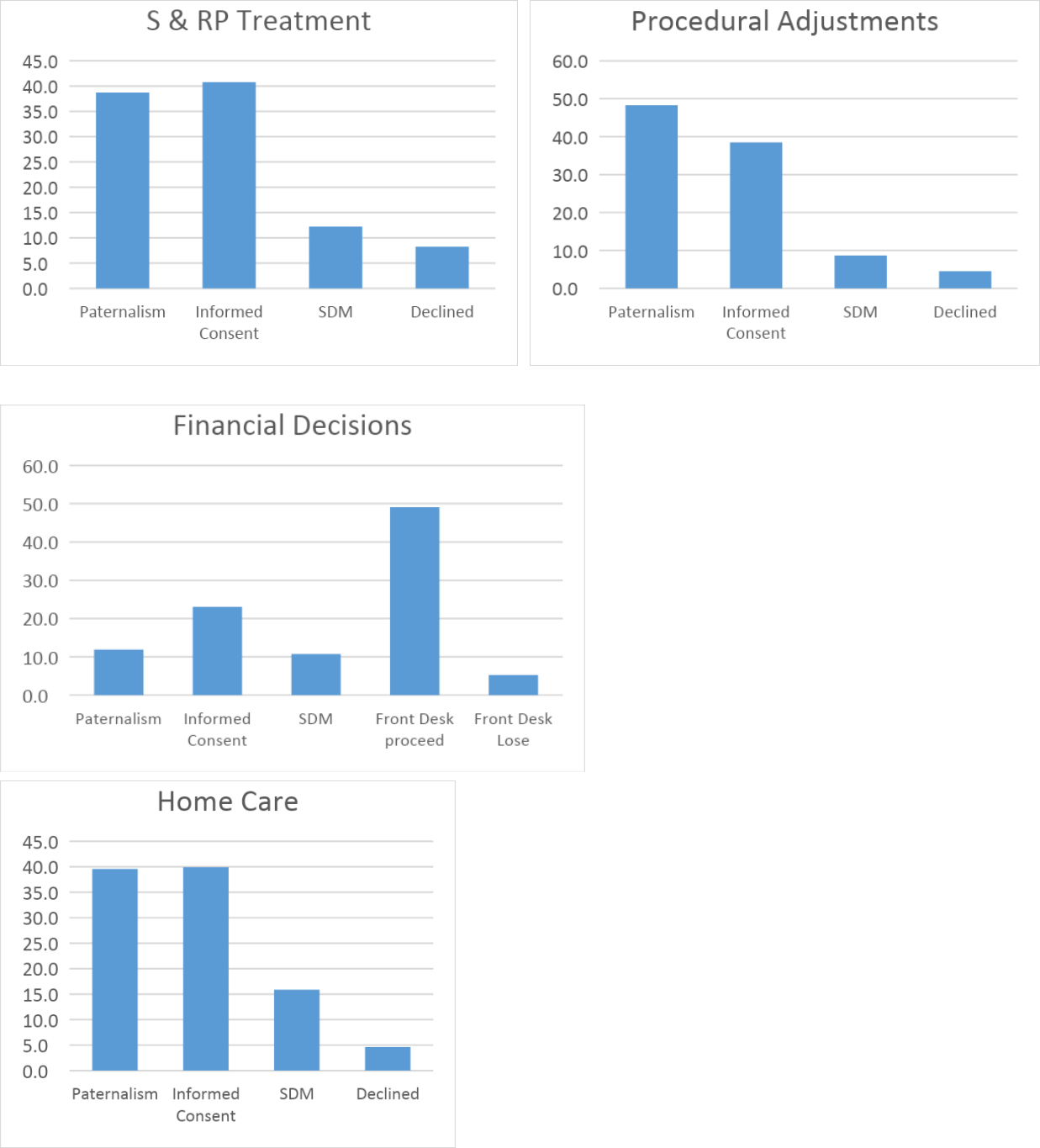


Table 2 Proportion of patients in various categories by treatment situation and approach.

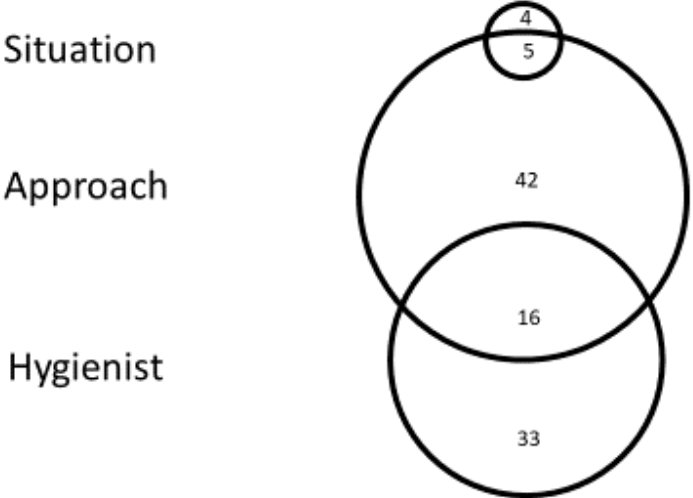
Situation	Approach	AverageSt Dev	ANOVA F	p	Groups
Treatment	1 Paternalism	38.7%	24.4	51.325	< .001 [1,2] [3,4]
	2 Informed Consent	40.8	22.7		
	3 SDM	12.3	10.6		
	4 Decline	8.2	7.5		
Procedure	1 Paternalism	48.3%	27.4	70.272	< .001 [1,2] [3,4]
	2 Informed Consent	38.5	24.5		
	3 SDM	8.7	10.2		
	4 Decline	4.6	6.1		
Financial	1 Proceed	11.9%	24.8	110.441	< .001 [4] [1,2] [3,5]
	2 Present	23.1	29.7		
	3 SDM	10.7	11.7		
	4 Front Desk	49.1	35.7		
	5 Lost	5.2	6.9		
Home Care	1 Paternalism	39.6%	19.2	69.640	< .001 [1,2] [3,4]
	2 Informed Consent	39.9	19.9		
	3 SDM	15.9	11.8		
	4 Decline	4.6	9.8		
Overall postponed treatment		18.9%	15.6		
Overall lost patients		23.3	15.7		

Table 2. N-Factorial ANOVA of patient participation by dental hygienist by situation by approach and proportion of causal variance attributable to factors and their interactions.

Source	df	MS	F	p	Variance
Hygienist	55	419.9	3.841	< .001	33%
Situation	3	8147.7	2.831		4
Approach	3	52871.4	15.163	< .001	42
Hygienist x Situation	163	77.7	.227		
Hygienist x Approach	165	683.8	1.999	< .001	16
Situation x Approach	9	3142.9	9.187	< .001	5

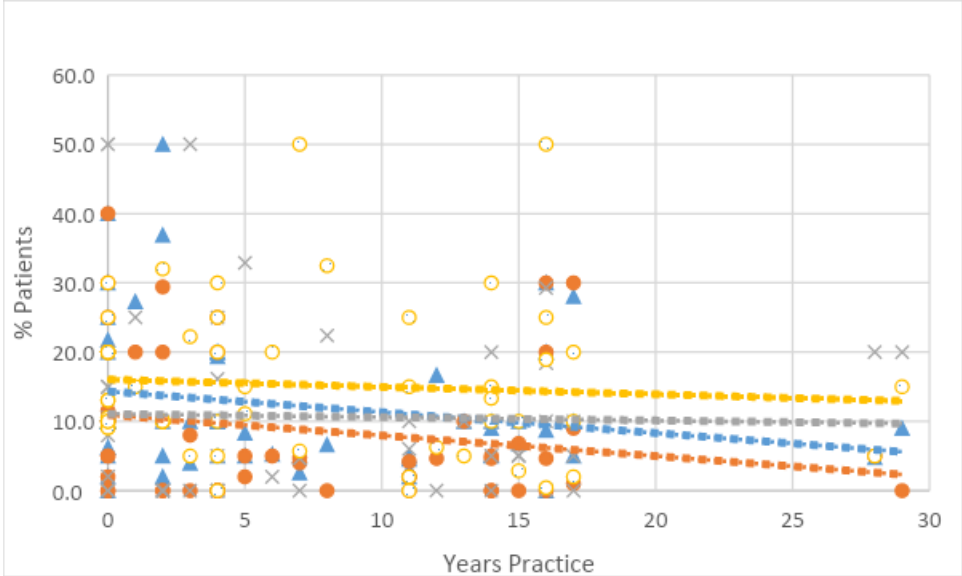
There is no Hygienist x Situation factor because all respondents rated the same situations, except for a few cases of missing data. Insignificant Situation effect is a function of the option in the cases of financial arrangements to involve a third party (front desk).

Figure 3. Primary and interaction sources of variance regarding patient participation in decisions regarding scaling and root planing.



Size of circles are roughly proportion to the variance contributed by each factor. Numbers in circles are proportion of variance determined by generalizability analysis.

Figure 4 Scattergram displaying use of SDM approach by dental hygienists in four scaling and root planing situations as a function of their years of practice.



Treatment: blue triangles, $r = -.201$, $p = .10$

Procedure: orange filled circles $r = -.212$, $p = .10$

Financial: yellow unfilled circles $r = -.030$, $p = \text{NS}$

Homecare: grey X sub boxes $r = -.072$, NS

Combined across situations: $r = -.129$, $p = .05$



Professional Preferences of Dental Hygienists, Treatment Options, and Presentation Approaches as Predictors of Patient Participation in Decisions Regarding Scaling and Root Planing Treatment

José Verdugo, Dental Hygiene Class of 2022
University of the Pacific, Arthur A. Dugoni School of Dentistry



Introduction

- EBD identifies three intersecting factors driving care decisions. Assumed to be of equal weight and well-integrated



- SDM
 - o Patient participation in treatment decisions
 - o PubMed lists 16,500 papers in medicine, 280 in dentistry
- Research Question
 - o What is the relative contribution to patient participation in their treatment of dental hygienist's professional practices, decision situations, and approaches to involving patients in SRP appointment?

Materials and Methods

- o IRB approval in exempt category, 2022-22
 - o Google forms digital survey
 - o https://docs.google.com/forms/d/1EAPoLScSHKYOXcGS6lbt5mOzCkmL5kGgpwkE-XYA_epIB97M5D5g/view/form?aspsf_link
 - o 335 graduates of Pacific's BS Dental Hygiene program and 20 current students.
 - o survey open for 2 weeks with 1 reminder.
 - o Four treatment situations in the SRP procedure
 - o Need for this procedure
 - o Various procedural decisions such as use of LA
 - o Financial authorization
 - o Home care instruction and aids
 - o Four approaches to patient participation
 - o Paternalism: proceed or announce and proceed
 - o informed consent: explain intended action and alternatives, give reasons and secure permission
 - o SDM: example alternatives, listen to patient information and concerns, reach common decision
 - o Decline: following any approach, patients declines recommended action or positions proceeding
- In the case of financial arrangements, there was a fifth alternative: refer patient to the front desk.

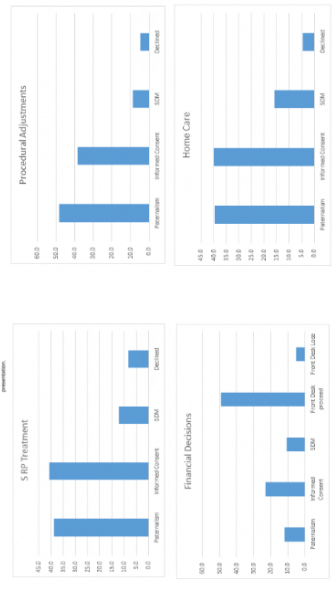
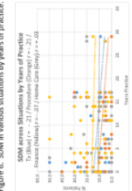
- o General questions
 - o Estimate average number of patients who fail to compete multiple-appointment procedures
 - o Estimate average number of patients who postponed multiple-appointment procedures
- o Demographics
 - o Number of years in practice
 - o Number of days in practice each week
 - o Position: private practice, practice in clinic situation, faculty, current student

Results

- o 58 responses: 40 private practice, 13 students, 3 faculty; 2 clinic; average days practice 3.1
- o Predictors of participation - Analysis of Variance

Table 1. Proportion of patients in various categories by treatment situation and approach.

Situation	Approach	Private Practice	Student	Faculty
Treatment	1. Shared/Announce	24.1	13.02	4.00
	2. Informed Consent	32.9	12.31	13.43
	3. Decline	43.0	74.67	82.57
Procedure	1. Shared/Announce	24.1	13.02	4.00
	2. Informed Consent	32.9	12.31	13.43
	3. Decline	43.0	74.67	82.57
Financial	1. Shared/Announce	24.1	13.02	4.00
	2. Informed Consent	32.9	12.31	13.43
	3. Decline	43.0	74.67	82.57
Home Care	1. Shared/Announce	24.1	13.02	4.00
	2. Informed Consent	32.9	12.31	13.43
	3. Decline	43.0	74.67	82.57



Conclusion

- o Shared decisions are not common during SRP planning procedures, although there are wide differences across professionals
- o Professionals appear to exert control in the office and patients appear to exert control outside of the office
- o SDM could be a means of promoting more mutual participation
- o Further research is possible
 - o Repeat with other BS programs
 - o A parallel study from the patients' perspective
 - o Attempt to demonstrate a relationship between patient participation and oral health outcomes

Literature Review

President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, 1982. *Making Health Care Decisions: The Ethical and Legal Implications of Informed Consent in the Patient-Practitioner Relationship*. Washington, 1982. Patients should have greater participation in decisions regarding their health care.

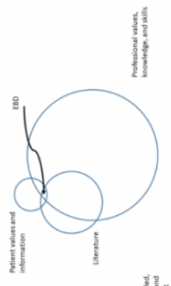
Elwyn G, Edwards A, Thompson R, Eds. Shared decision making in health care: achieving evidence-based patient choice 3rd ed. Oxford, UK: Oxford University Press; 2016. Forty-five papers on the state of the field.

Berger Z, Galaskinski D, Scalin P, Dong K, Blunt HB, Elwyn G. The submissive silence of others; examining definitions of shared decision making. Patient Educ Coun. doi.org/10.1016/j.psc.2021.10.026 [prepublication]. Patients still participate little in decisions regarding their care.

Discussion

- o DH offer patients informed consent or proceed without patient input in most cases
- o This is the pattern across the four situations studied
- o Patterns in the profession (across professionals) drive 42% of the degree of patient participation
- o Individual DH personal preferences drive 48% of the degree of patient participation
- o There is a large variation across DH on their personal approach
- o The longer DH have practiced, the less likely they are to invite patient participation
- o Patients' primary means of advancing their positions is through financial arrangement and postponing or discontinuing treatment

A potential view of EBD based on contribution of sources and their interaction.



More research is needed, specifically patients and professional programs

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