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Comparison of Three Measures of Shared Decision-Making: SDM Process_4, CollaboRATE, and SURE Scales

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Abstract

Introduction.—If shared decision making (SDM) is to be part of quality assessment, it is necessary to have good measures of SDM. The purpose of this study is to compare the psychometric performance of three short patient-reported measures of SDM.

Methods.—Patients who met with a specialist to discuss possible surgery for hip or knee osteoarthritis (Hips/Knees), lumbar herniated disc or lumbar spinal stenosis (Backs) were surveyed shortly after the visit and again six months later. Some of the patients saw a patient decision aid (PDA) prior to the meeting. The three SDM measures were the SDM Process_4 (SDMP) survey, CollaboRATE and SURE scale. The follow-up survey included measures of decision regret, satisfaction and decision quality.

Results.—The sample (n=649) was mean age 63.3 years, 51% female, 60% college educated, included more Hip/Knee patients than Back patients (69% vs 31%). 49% of all patients had surgery. For Hips/Knees, the SDMP and SURE scores were significantly associated with viewing all the PDA compared to those who did not ($p<0.001$), but not for CollaboRATE ($p=0.35$). For Backs, none of the scores were significantly associated with viewing all the PDA. All three scores were significantly associated with less regret and higher satisfaction ($p<0.001$) for Hips/Knees.

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For Backs, only SURE and CollaboRATE were significantly associated with less regret, and only SDMP was significantly associated with higher satisfaction. For Hips/Knees and Backs, the SDMP and SURE scales were significantly associated with an Informed Patient-Centered Decision ($p<0.001$), but this relationship was not significant for CollaboRATE (Hips/Knees: $p=0.24$, Backs: $p=0.25$).

Discussion.—Each measure has some evidence of validity. SURE and SDMP better discriminate use of PDAs and higher decision quality.

The goal of shared decision making (SDM) is to help patients make better health decisions (1, 2). In 2017 the National Quality Forum published a consensus definition of SDM, describing it as a process of communication in which clinicians and patients work together to make optimal healthcare decisions that align with what matters most to patients (3). The SDM definition specifies three components: 1) clear, accurate and unbiased medical evidence about reasonable alternatives – including no intervention – and the risks and benefits of each, 2) clinician expertise in communicating and tailoring that evidence for individual patients and 3) patient values, goals and informed preferences and concerns, which may include treatment burdens. Measuring the quality of a health decision therefore includes ensuring the patient understands the key facts of their condition including the risks, benefits and alternatives of the treatment options; the patient is meaningfully involved in the treatment decision; and the patient receives the treatment that he or she preferred (4, 5).

As national policy and payment initiatives calling for SDM have increased, it is necessary to have practical measures to assess whether SDM has occurred. Although there are measures that categorize SDM behaviors using audio recordings of a patient-clinician visit, these measures do not include SDM behaviors occurring outside of visits and are not practical for routine clinical use. (6, 7). There are many available patient-reported measures to assess the process of SDM (8), but there is a lack of evidence about their measurement properties (9). Gartner and colleagues recommended strategies to improve the validity of SDM measurement tools by focusing on content validity analyses since there is no gold standard with which to evaluate the SDM measures (9).

Three short, patient-reported SDM measures were included in a recent quality improvement project: the SDM Process_4 (SDMP), CollaboRATE, and the SURE Scale. The measures were selected for the study because of their widespread use in studies of decision aids and their brief length. Each tool takes a different approach to assessing the patient's involvement in the decision. The SDMP, which is an NQF-endorsed measure for elective surgery decisions, asks the patient to report on specific, concrete behaviors in their interaction with their providers *(e.g. how much did you and your health care providers talk about the reasons to have surgery?)* (2). The CollaboRATE tool asks the patient to rate the quality of their provider's communication at a more general, high level *(e.g. How much effort was made to help you understand your health issue?)* (10, 11). The SURE scale asks the patient to rate their own level of uncertainty about which treatment to choose (e.g. "*Do you feel that you know the benefits and risks of each option?*") (12).

The aim of this study is to compare the content, discriminant and predictive validity of these three short measures of SDM in a sample of patients who completed all three measures as part of a quality improvement study of patient decision aid implementation.

METHODS

This study is a secondary analysis of data from a prospective, longitudinal study of patients seen by 12 orthopedic specialists in Boston, MA. There were 5 hip and knee surgeons that saw the hip and knee patients and 7 spine specialists (5 surgeons and 2 physiatrists) that saw back patients. The original study was designed to integrate four patient decision aids (PDAs) in routine orthopedic care. Participants were eligible if they attended a visit with a participating specialist to discuss treatment of hip or knee osteoarthritis (Hips/Knees) or lumbar herniated disc or lumbar spinal stenosis (Backs). The detailed eligibility and exclusion criteria are published elsewhere (13). The study enrolled two groups, a usual care group of patients surveyed before the intensive efforts to integrate decision aids and then an intervention group of patients surveyed after those efforts were made. For Hip/Knee patients, PDAs were mainly ordered by the scheduling staff and sent to the patient prior to the visit with the specialist. For Back patients, the PDAs were ordered at the visit and sent to the patient's home after the visit, once the diagnosis was established. The methods and primary findings have been published previously (13–15). For these analyses, the usual care and intervention groups were combined.

Data Collection Protocol

Participants were mailed a survey one week after their orthopedic visit and again six months later, or if they had surgery, six months after the surgery. The survey included a small incentive. Study staff made up to three reminder phone calls and one reminder mailing to non-responders. The initial survey included the three SDM measures (SDMP, CollaboRATE and SURE), the relevant Decision Quality Instrument, the patient's preferred treatment, and an assessment of the amount of the PDA they viewed. The 6-month survey included questions on surgical status, the Decision Regret Scale (16), a question on treatment satisfaction and the treatment received, as well as overall and disease-specific quality of life.

Variables

SDMP.—The SDM Process_4 score was calculated based on responses to four questions about how much the pros and cons of the decision were discussed, if surgical and non-surgical treatments were explained and if the provider asked what the respondent wanted to do. The score is based on questions first used in the DECISIONS study conducted by the University of Michigan and have been used in several subsequent studies, as well as endorsed by NQF for elective surgical decisions (3, 17). The measure has demonstrated reliability (both internal consistency and short term test-retest reliability) (18) and strong construct validity, including inverse relation to decision regret (19) and positive relation to informed patient-centered decisions (18), and inverse relation to decision dissonance (20). Further, there is evidence of agreement in responses to these items from breast cancer patients and observers (21). The tool's score range is 0–4 points. One point was assigned for discussing the pros 'a lot' or 'some', for discussing the cons 'a lot' or 'some', for responding

'yes' if the provider explained the options, and for responding 'yes' that the provider asked the patient what treatment they wanted. A higher score indicates more involvement in the decision (2) (Appendix).

CollaboRATE.—The CollaboRATE measure is a 3-item patient-reported measure assessing the patient's perception of how much effort was made to help them understand their health issue, how much the provider listened to them about their health issue, and how much effort was made to include what matters most to the patient in choosing what to do next. Each item is scored on a 1–10 scale from 'no effort was made' to 'every effort was made'. A higher score indicates a better experience. The CollaboRATE scale is typically reported as the percent with the top score versus anything less (10, 11). A validation study using simulated patient encounters found the top score method had moderate reliability, and positive correlations with the SDM-Q-9 and a measure of physician communication (11) (Appendix).

SURE.—The SURE scale is a four-item short form of the Decision Conflict Scale (DCS). (22) It describes the patients' uncertainty about which treatment to choose and factors contributing to uncertainty about the benefits and risks of the options, what matters most to the patient, support in making a choice, and feeling sure about the best choice. The response to each question is scored as true or false with a 0–4 range. A score of less than four is considered to indicate decision conflict. The SURE scale is reported as the percent with the top score of 4 (12). The short version has shown adequate internal consistency, moderate correlation to the full DCS, and adequate sensitivity and specificity of the cutoff of 3 or less for identifying clinically significant decisional conflict (22) (Appendix).

PDA Viewing.—Patients were asked on the 6-month survey how much of the PDA booklet they read or how much of the accompanying DVD they watched. The response options were none, some, most, and all. Participants who reported they read all of the booklet or watched all of the DVD were compared to those who reported they read or watched none, some or most of the booklet or DVD, or did not get a PDA.

Decision Regret.—A measure of regret was collected on the 6-month survey using the Decision Regret Scale (16). This tool, which is based on a 5-item Likert scale, measures distress or remorse after a decision. The scale has demonstrated strong internal consistency. It is scored on a linear scale of 0–100 with lower scores indicating less regret. Due to the floor effect in this analysis, the data was dichotomized to those with no regret versus any regret.

Overall satisfaction.—One item was used to assess overall satisfaction. On the 6-month survey patients were asked overall how their treatment for hip, knee or back pain had worked out. The 7 response options ranged from delighted to terrible. Patients were categorized as satisfied if their response was delighted, pleased or mostly satisfied.

Informed, Patient-Centered Decision (IPC Decision): The IPC Decision is an indicator variable derived from Decision Quality Instruments that tracks the percentage of patients who are informed and receive their preferred treatment (14, 18, 19, 23). Patients

who stated that they preferred surgery and received it within six months, as well as those who said they did not want surgery and did not get surgery within six months were considered to have matched. All others, including those who responded 'unsure' did not match. Patients who scored 60% or higher on the knowledge test for Hips/Knees or 40% or higher on the knowledge test for Backs **and** received their preferred treatment met the criteria for an IPC Decision (14). The knowledge thresholds were derived from mean scores of samples who received a PDA (scores for Backs were lower than Hips/Knees) (18, 23). In a prior analysis of these data that used the same knowledge questions and cutoffs, sensitivity analyses were conducted by changing the cutoffs, which did not result in meaningful differences (14). Respondents who were missing 3 or more knowledge items or missing a response for the preferred treatment item did not get an IPC value.

A Priori Hypotheses

To assess discriminant validity, we hypothesized that patients who reviewed all of a PDA would have higher SDM scores compared to those who did not receive a PDA or reviewed less than all of the PDA.

To assess predictivity validity, we hypothesized that patients with higher SDM scores would have less regret and higher satisfaction with the decision at six months compared to those with lower SDM scores.

To assess construct validity, we hypothesized that patients with higher SDM scores would be more likely to have made an IPC Decision compared to those with lower SDM scores.

Statistical Analyses

Means and standard deviations were used to summarize continuous variables and frequencies with percentage were used to describe categorical variables. For the three SDM measures, the SDMP was summarized using the mean score while the CollaboRATE and SURE scales were presented as the percentage with the top score.

To test for discriminant, predictive, and construct validity, we compared the SDM measures based on PDA viewing, decision regret, overall satisfaction, and IPC decision, stratified by condition. We conducted a sensitivity analysis addressing our primary hypothesis of the effect of PDA viewing, stratifying by those who received a PDA and reviewed some, most or all compared to those who didn't receive the PDA, or received it and reviewed none.

We used the generalized linear models with the Generalized Estimating Equations (GEE) approach to account for the clustering of patients within clinicians. We used the identity link for SDMP score, and the logit link for the percentage with top CollaboRATE and SURE scores.

Since the amount of missing data from each measure was small (less than 5%), the observations with missing data were excluded in the analysis. All analyses were conducted using SAS version 9.4 (SAS Institute, Cary, NC). A two-sided p-value of < 0.05 was the threshold for statistical significance. The Partners Human Research Committee Institutional Review Board approved this study.

RESULTS

A total of 649 patients were enrolled in the study, which was an overall 70.4% response rate. Results were stratified by condition: hip and knee replacement (Hips/Knees) or spinal stenosis and herniated disk (Backs). There were no significant differences in the outcome variables used in this analysis between the usual care and intervention groups (data not shown), so the two groups were combined for the analysis. Sample characteristics are presented in Table 1. More than two-thirds of the sample were Hip/Knee patients (69.2%) and 30.8% were Back patients.

All three surveys had low rates of missing data (SDMP - 1.0% for Hips/Knees and 2.2% for Backs, CollaboRATE - 2.0% for Hips/Knees and 2.4% for Backs, and SURE - 4.5% for Hips/Knees and 4.5% for Backs). The three scales were positively correlated (Pearson correlation coefficients ranged from 0.23–0.44 for Hips/Knees and 0.40–0.45 for Backs) (Table 2).

The mean (SD) SDMP score was 2.4 (1.2) for Hips/Knees and 2.4 (1.3) for Backs (p=0.74). The with top score for CollaboRATE was 29.5% for Hips/Knees and 32.7% for Backs (p=0.46). The % with top score for SURE was 74.4% for Hips/Knees and 53.4% for Backs (p<0.001). Table 3 presents the results of the tests for discriminant validity. Of the 449 hip/knee patients, 210 (47%) did not receive the PDA, 14 (3%) received it but reviewed none, 28 (6%) reviewed some, 21 (5%) reviewed most, 138 (31%) reviewed all, and 38 (8%) had a PDA ordered but did not provide any information on the extent of review. Of the 200 back patients, 128 (64%) did not receive the PDA, 7 (3%) received it but reviewed none, 10 (5%) reviewed some, 7 (3%) reviewed most, 40 (20%) reviewed all, and 8 (4%) had a PDA ordered but did not provide any information on the extent of review. Our a priori hypothesis was that patients who reviewed all of the PDA would have higher SDM scores than those who reviewed less than all. The results of the sensitivity analyses comparing patients who reviewed any versus none, some or all or did not receive it were not meaningfully different (data not shown). For Hips/Knees, the SDMP and SURE scores were significantly associated with viewing all the PDA compared to those who did not (p<0.001), but this finding did not hold for CollaboRATE (p=0.35). For Back patients, none of the SDM measures were significantly associated with viewing all the PDA.

Table 4 contains the results of the predictive validity analyses. All three SDM scores were significantly associated with less regret (p<0.001) and higher satisfaction (p<0.001) for Hips/Knees. For Backs, the SURE and CollaboRATE measures were significantly associated with less regret, and only the SDMP measure was significantly associated with higher overall satisfaction.

To assess construct validity, we had hypothesized that patients who made an IPC Decision would have higher SDM scores (Table 5). For Hips/Knees and Backs, patients who made an IPC Decision had significantly higher SDMP and SURE scores (p<0.001), but this relationship was not significant for either condition for CollaboRATE (Hips/Knees: p=0.24 and Backs: p=0.25). Table 6 provides a high-level summary of the various results of the validity testing to enable comparisons across the surveys.

DISCUSSION

The objective of this analysis was to assess the validity of three patient-reported measures of SDM using data collected from a quality improvement project. Each scale takes a different approach to measuring to what extent SDM occurred and each measure had some evidence of validity. The SDMP measures the extent of the interaction between the patient and provider when a decision is being discussed. CollaboRATE measures the patient's assessment of how much effort the doctor made at a visit to help them understand the issue and integrate their preference into the decision, and the SURE scale assesses the patient's decisional conflict regarding the decision. Although the three measures are significantly correlated, the magnitude of the correlation coefficients are relatively small, suggesting they are measuring different constructs. Deciding which patient-reported SDM measure to use will depend on the situation and the measurement goal.

Many researchers are interested in measures that will be able to detect a difference between usual care and decision support interventions designed to promote SDM, such as PDAs. The SDMP and SURE measures were able to discriminate between patients considering hip or knee surgery who reviewed all of a PDA compared to those who did not, but none of the measures discriminated between PDA viewing for Backs. The difference in the timing of PDA delivery might explain these results. The majority of those considering hip/knee surgery received a PDA before their visit with the surgeon, but the Back patients received the PDA after the visit. PDAs reliably increase patient knowledge and encourage patient participation in decisions. Hence, the Hip/Knee patients who reviewed the PDA may have had a different interaction compared to those who did not view it. The Back patients who got the PDA after the visit, may have not had a different interaction with the surgeon and as a result, the lack of difference in scores may be appropriate and suggest validity of these measures.

Predictive validity was assessed by exploring the associations of the various SDM measures for patients with their reports of regret and satisfaction with the decision. In fact, all three measures showed results in the hypothesized directions for both regret and decision satisfaction for Backs as well as Hip/Knees. The differences were all highly statistically significant for Hips/Knees, but they did not all reach statistical significance for Backs. The lack of significance may be due to the smaller sample sizes for the Back decisions.

The ultimate goal of SDM is to foster informed, patient-centered decisions (2). As a result, we tested construct validity by comparing those who did and did not make an IPC Decision. The IPC measure is an NQF-endorsed measure of decision quality derived from Decision Quality Instruments and has been shown to have high reliability and validity (14). The SDMP and SURE scales for patients considering the Hip/Knee and Back decisions were significantly related to the IPC measures, but this was not observed for CollaboRATE. Given the goal of SDM, evidence of the relationship between the SDMP and SURE scales and the IPC Decision is perhaps the most important test of validity for these self-reported SDM measures.

There are several limitations of this study. The generalizability of the results may be limited by the lack of racial and ethnic diversity in the sample and the focus on orthopedic surgery decisions. The sample was also relatively well educated. The limited sample size in Backs may have contributed to lack of statistical significance for some of the tests. Additionally, multiple testing across the four validity measures for the two conditions could have resulted in some spurious findings. Satisfaction with how the treatment worked out was assessed at 6 months using one question, which may not have adequately captured all the dimensions of satisfaction. The discriminant validity hypothesis focused on the use of a PDA outside the visit. As a result, the lack of discriminant validity of CollaboRATE may be because the intervention did not change physician behavior. On the other hand, patients may give credit to physicians for providing tools, such as PDAs, as part of their care, that may result in higher scores. There is a need to evaluate these measures for other types of decisions, such as the decision to take a medication or have a cancer screening. It is unclear how these tools might be used and interpreted in the context of chronic condition management when there are ongoing decisions or multiple decisions to make. This was an observational study, which has implications for the analyses and findings of this study.

Conclusion

Each SDM scale takes a different approach to measuring SDM, and each has some evidence of validity. Of the three, SURE and SDMP were more responsive to the use of PDAs and more predictive of high decision quality. All three measures had stronger evidence of validity in Hips/Knees than Backs, although the larger Hip/Knee samples were no doubt responsible for some of this difference. This comparison provides information for deciding which tools are most helpful at the clinical level for measuring the practice of SDM.

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Appendix

	SDMP	**CollaboRATE**	**SURE**
What constructs are being measured?	Patient report of the extent of the interaction between the provider and patient that meet the standards of SDM when surgical decisions are made.	Patient ratings of the extent to which their healthcare provider helped them to understand their health issue, listened to them and included them in the decision-making.	Patient report of their uncertainty about which treatment to choose and factors contributing to uncertainty (feeling uninformed, unclear values, and unsupported decision making).
Questions and responses	-Did any of your health care providers talk about __ as an option for you? *Y/N* -How much did you and your healthcare providers talk about	-How much effort was made to help you understand your health issues? *1 (no effort was made)-10 (every effort was made*)	-Do you feel that you know the benefits and risks of each option? *Y/N*

	SDMP	CollaboRATE	SURE
	the reasons to have surgery to treat your ___? *A lot/Some/A little/Not at all* -How much did you and your health care providers talk about the reasons not to have surgery to treat your __? *A lot/Some/A little/Not at all* -Did any of your health care providers ask you whether you wanted to have surgery for your ___ or not? *Y/N*	-How much effort was made to listen to the things that matter most to you about your health issues? *1 (no effort was made)- 10 (every effort was made)* -How much effort was made to include what matters to you in choosing what to do next? *1 (no effort was made)- 10 (every effort was made)*	-Are you clear about which benefits and risks mattered most to you? *Y/N* -Do you have enough support and advice to make a choice? *Y/N* -Do you feel sure about the best choice for you? *Y/N*

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Table 1

Patient Characteristics by Orthopedic Condition

	Hip/Knee N=449*	Backs N=200*
Age, y, mean (SD)	64.8 (10.8)	59.9 (15.2)
Female	56%	42%
Race/ethnicity		
White	93%	87%
Black	2%	5%
Hispanic	1%	2%
Other	4%	6%
Education		
High school or less	15%	17%
Some College	22%	27%
College degree or more	61%	56%
Had surgery	57%	31%
SDMP, mean (SD)	2.4 (1.2)	2.4 (1.3)
CollaboRATE Top Score	29%	33%
SURE Top Score	74%	53%
Median number of patients per physician	128	31

*N for each item varies due to nonresponse.

Table 2

Pearson Correlation Coefficients by Orthopedic Condition

Hip/Knee	**SDMP**	**CollaboRATE**	**SURE**
SDMP	1	0.38*	0.23*
CollaboRATE		1	0.44*
SURE			1
Backs	**SDMP**	**CollaboRATE**	**SURE**
SDMP	1	0.41*	0.43*
CollaboRATE		1	0.45*
SURE			1

*$P<0.001$.

Table 3

Tests of Discriminant Validity

	Hip/Knee N=449			Backs N=200		
	Reviewed All of PDA			Reviewed All of PDA		
	No	Yes		No	Yes	
	N=311 (69%)	N=138 (31%)	*P* value	N=16 (80%)	N=40 (20%)	*P* value
Mean SDMP (SD)	2.3 (1.2)	2.7 (1.2)	0.001	2.3 (1.3)	2.4 (1.2)	0.49
% Top Score, CollaboRATE	27.6%	33.6%	0.35	31.6%	36.8%	0.32
% Top Score, SURE	69.5%	85.1%	<0.001	56.2%	42.1%	0.30

Table 4

Tests of Predictive Validity

	Hip/Knee*			Backs*		
	Regret N=117 (34%)	**No Regret N=229 (66%)**	***P* value**	**Regret N=65 (45%)**	**No Regret N=80 (55%)**	***P* value**
Mean SDMP Score (SD)	2.3 (1.2)	2.5 (1.2)	<0.001	2.3 (1.4)	2.7 (1.2)	0.11
% Top Score, CollaboRATE	18.3%	35.7%	<0.001	28.6%	43.0%	0.03
% Top Score, SURE	61.3%	86.5%	<0.001	46.2%	66.7%	0.005
	Not Satisfied N=120 (33%)	**Satisfied N=248 (67%)**	***P* value**	**Not Satisfied N=64 (41%)**	**Satisfied N=92 (59%)**	***P* value**
Mean SDMP Score (SD)	2.3 (1.2)	2.5 (1.2)	<0.001	2.1 (1.4)	2.6 (1.2)	<0.001
% Top Score, CollaboRATE	17.9%	32.5%	<0.001	29.7%	39.3%	0.12
% Top Score, SURE	57.5%	83.1%	<0.001	44.4%	60.7%	0.07

*Based on number who responded to the question about regret or satisfaction and the SDM scores.

Table 5

Tests of Construct Validity

	Hip/Knee			Backs		
	Informed Patient-Centered (IPC) Decision			Informed Patient- Centered (IPC) Decision		
	No*	Yes		No**	Yes	
	N=268 (61%)	N=174 (39%)	*P* value	N=140 (71%)	N=58 (29%)	*P* value
Mean SDMP Score (SD)	2.3 (1.2)	2.7 (1.1)	<0.001	2.0 (1.3)	3.2 (0.9)	<0.001
% Top Score, CollaboRATE	27.5%	32.4%	0.24	30.9%	37.9%	0.25
% Top Score, SURE	63.0%	92.3%	<0.001	39.8%	83.9%	<0.001

*Uninformed/Treatment aligned – 52%; Informed/Treatment Not Aligned – 22%; Uninformed/Treatment Not Aligned – 26%.

**Uninformed/Treatment aligned – 53%; Informed/Treatment Not Aligned – 15%; Uninformed/Treatment Not Aligned – 32%.

Table 6

Summary of Results

	SDMP		CollaboRATE		SURE	
	Hip/Knee	**Back**	**Hip/Knee**	**Back**	**Hip/Knee**	**Back**
Discriminant Validity (PDA viewing)	+	–	–	–	+	–
Predictive Validity (Regret)	+	–	+	+	+	+
Predictive Validity (Satisfaction)	+	+	+	–	+	–
Construct Validity (IPC decision)	+	+	-	–	+	+

+ indicates a statistically significant finding;

- indicates statistically nonsignificant finding.