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Impact of Cost Conversation on Decision-Making Outcomes

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Abstract

Objective: To understand the impact of cost conversations on the following decision-making outcomes: patients' knowledge about their conditions and treatment options, decisional conflict, and patient involvement.

Patients and Methods: In 2020 we performed a secondary analysis of a randomly selected set of 220 video recordings of clinical encounters from trials run between 2007 and 2015. Videos were obtained from eight practice-based randomized trials and one pre−post-prospective study comparing care with and without shared decision-making (SDM) tools.

Results: The majority of trial participants were female (61%) and White (86%), with a mean age of 56, some college education (68%), and an income greater than or equal to $40,000 per year (75%), and who did not participate in an encounter aided by an SDM tool (52%). Cost conversations occurred in 106 encounters (48%). In encounters with SDM tools, having a cost conversation lead to lower uncertainty scores (2.1 vs 2.6, $P=.02$), and higher knowledge (0.7 vs 0.6, $P=.04$) and patient involvement scores (20 vs 15.7, $P=.009$) than in encounters using SDM tools where cost conversations did not occur. In a multivariate model, we found slightly worse decisional conflict scores when patients started cost conversations as opposed to when the clinicians started cost conversations. Furthermore, we found higher levels of knowledge when conversations included indirect versus direct cost issues.

Conclusion: Cost conversations have a minimal but favorable impact on decision-making outcomes in clinical encounters, particularly when they occurred in encounters aided by an SDM tool that raises cost as an issue. KeywordsCost conversations; shared decision making; decision-making

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Over the last decade, patients have experienced an increase in out-of-pocket costs to cover health care expenses.[1] In turn, this has led to many patients suffering from financial hardship which could directly impact health outcomes.[2] Financial hardship has been associated with mortality among patients with cancer[3] and has been identified as a risk factor for delaying medical care or skipping recommended treatments or filling of prescriptions.[4-6] Further, high out-of-pocket health care costs are associated with patients struggling with other nonmedical needs; in a nationwide survey, one-third of patients reported difficulty paying for heat, food, or housing.[7] And while the enactment of the Affordable Care Act in 2010 has widened insurance coverage for Americans, it is questionable whether the Affordable Care Act has lived up to its promises of cost containment; out-of-pocket expenses increased by 12% between 2014 and 2017.[8]

One approach to preventing and addressing patients' financial hardships is through cost conversations between patients and their clinicians.[9-14] Cost conversations at the point of care have the potential to result in cost-sensitive care plans that patients can feasibly implement, lessen the need for future discovery and remediation of cost-related adherence issues, and mitigate their harms.[15-17] Despite the potential benefits of increased discussion of cost, studies document that the incidence of cost conversations varies from 15% to 65%.[18-23]

This may be due in part to potential barriers to having cost conversations during

clinical encounters.[24,25] One potential barrier is that bringing up issues of cost during the encounter has unclear or potentially even detrimental impact on the decision-making process. For instance, cost issues emerging in the conversation may be perceived as a barrier to receiving adequate treatment; or patients might not want to have cost conversations as part of their treatment decisions because they might be concerned they will be judged as poor. In short, there is a clear need to understand the impact of cost conversation in decision-making.

Shared decision-making (SDM) tools are evidence-based instruments that improve communication between clinicians and patients making specific choices among health care options.[26,27] By highlighting different attributes of health care options, the use of these tools may help elucidate and support discussions of relevant issues such as cost while making treatment decisions.[28] Previously, we have shown that SDM tools that incorporate cost information increased the incidence of cost conversations.[29] Encounters supported by decisions aids had 8 times higher odds of having cost conversations than encounters not supported by SDM tools.[29] This project builds on those findings by examining the impacts that cost conversations, whether supported or not by SDM tools, have on decision-making outcomes.

PATIENTS AND METHODS

Population and Data Source
We used a random sample of 220 video recordings of clinical encounters obtained during the conduct of eight practice-based randomized trials and one pre–post-prospective study.[30-35] These studies aimed to assess the impact of SDM tools (used during the encounter between clinician and patient) on the management of a variety of conditions including chest pain, diabetes, Graves' disease, depression, and osteoporosis, as well as cardiovascular risk prevention (Supplemental Table 1, available online at http://mcpiqojournal.org).[29] From these trials, we obtained basic patient demographics and the results of patients' post-encounter surveys. These post-encounter surveys assessed patients' knowledge about their conditions and treatment options and decisional conflict scores using the decisional conflict scale (DCS).[36] DCS measures personal perception of uncertainty in choosing options; factors contributing to uncertainty such as feeling uninformed, unclear about personal values, and unsupported in decision making; and effective decision-making. Finally, for each trial we extracted observing patient involvement in decision making scores (OPTION12) as a surrogate of patient engagement.[37]

Coding Scheme
We developed an extraction coding scheme a priori based on available literature about cost conversations and a previous coding scheme used to analyze audio recordings of cost conversations with patients with cancer.[38] Whenever a cost issue was discussed, we assessed who initiated the first conversation in the encounter (clinician vs patient) and the nature of cost-related issues discussed (direct vs indirect). Direct costs refer to expenses attributable to the use of health care interventions and directly affecting patients' finances (eg, drug costs, insurance-related costs, travel costs, future costs of care).[39] Indirect costs refer to effects on patients' finances as a result of disease and treatment burdens in patients' work, personal, and social lives (eg, patient productivity and lost wages, administrative burden costs, basic needs costs, required lifestyle/behavioral change costs, family impacts, child/elder care).[40] We also noted whether or not the cost issue was addressed (ie, some action was taken), acknowledged (ie, the issue was remarked upon but no action was taken), or ignored by the clinician(s).

Coding Scheme Calibration
Three researchers were trained to use the coding scheme and then asked to code an initial set of 10 videos for calibration. The three coders met to review coding results for concordance, resolve disagreements in data interpretation, and refine coding scheme definitions. After two rounds of calibration using the first 10 videos, coders were asked to multiple-code three additional videos to ensure that all coders were able to identify the cost conversations; after one round of

TABLE 1. Descriptive characteristics[a,b]			
	Conversation with cost (N = 106)	Conversation without cost (N = 114)	P[c]
Study			
Chest pain	2 (1.9)	52 (45.6)	<.001
DAD, diabetes, TRICEP	34 (32.1)	11 (9.6)	
Graves' disease	17 (16.0)	15 (13.2)	
IADAPT	30 (28.3)	9 (7.9)	
Osteo	13 (12.3)	18 (15.8)	
Statin choice	10 (9.4)	9 (7.9)	
Sex			
Female	66 (62.3)	69 (60.5)	.791
Male	40 (37.7)	45 (39.5)	
Age, years			
Mean ± SD	56.0±15.8	55.7±13.0	.875
Min, max	21, 84	18, 83	
Race			
White	93 (87.7)	97 (85.1)	.862
Asian	1 (0.9)	2 (1.8)	
Black/African American	6 (5.7)	5 (4.4)	
Other	2 (1.9)	5 (4.4)	
Unknown	4 (3.8)	5 (4.4)	
Education			
Less than college education level	42 (39.6)	24 (21.1)	.003
Some college or more	63 (59.4)	87 (76.3)	
Missing	1 (0.9)	3 (2.6)	
Income			
< $40,000	31 (29.2)	24 (21.1)	.007
≥$40,000	36 (34.0)	69 (60.5)	
Missing	39 (36.8)	21 (18.4)	
Use of SDM tool			
Control	41 (38.7)	74 (64.9)	<.001
SDM tool	65 (61.3)	40 (35.1)	

[a]DAD, decision aids for diabetes; IADAPT, translation of comparative effectiveness of depression medications into practice; SDM, shared decision-making tool; TRICEP, translating information on comparative effectiveness into practice.

[b]Values are n (%) unless otherwise stated.

[c]Student's t-test for continuous variables, χ^2 test for categorical variables, and Fisher exact test for categorical variables with frequencies less than 5.

reviewing codes for the final three videos, the coders began coding the full dataset independently. Soon after initiating the full dataset video coding, one coder left the project and two coders completed the rest of the analysis. During the analysis a duplicate set of 10 videos (unknown by the coders) was used to both monitor agreement and estimate an overall kappa statistic (kappa = 1) and an additional duplicate set of five videos (known to the coders) was used to allow the two coders to continue to meet and calibrate agreement if needed.

Study Outcomes

We examined the impact of cost conversations between patients and clinicians on decision-making outcomes including patients' knowledge about their conditions, decisional conflict (measured by a DCS score that consists of informed, support, uncertainty, and effective subscales), and level of patient engagement (measured by an OPTION12 score). The DCS subscales consist of multiple questions presenting participants with a 5-point scale where 0 meant that they strongly agreed and 4 meant they strongly disagreed. Thus, for

all DCS subscales, a lower score means that the participant was more confident in their response. We also assessed the impact of who started the cost conversation (clinician vs patient), whether or not the cost conversation was addressed by the clinician, the nature of cost issues discussed (direct vs indirect costs), and the use of SDM tools (used vs not) on the outcomes of interest.

Analysis

The secondary analysis took place in 2020 from trials ran between 2007 and 2015. We calculated descriptive statistics for patient's baseline characteristics. We reported categorical variables as frequencies and percentages, whereas continuous variables are reported using mean and standard deviation. The differences between encounters with and without cost conversations were tested using $\chi 2$ tests and Fisher exact tests for categorical variables and Student t-tests for continuous variables respectively. Differences between the SDM tool group compared to the control group were also analyzed for whether or not there was a cost conversation using Student's t-tests. We used linear regression models to analyze the impact of cost conversation factors on the DCS scores within the subset of participants who had a cost conversation. Regression results are reported using point estimates and their 95% confidence intervals for each covariate. The covariates used in every model were whether or not an SDM tool was used, who (clinician or patient) initiated the conversation, whether a direct or indirect cost was mentioned, and if the clinician addressed the concern. A sensitivity analysis looking only at the control subgroup was performed to analyze differences in outcomes between those encounters with a cost conversation and those that did not have one. Analyses were performed in R Statistical Software version 3.4.1 (Foundation for Statistical Computing). $P<.05$ was considered statistically significant.

RESULTS

There were 220 participants whose descriptive characteristics are displayed in Table 1. The majority of participants were female (61%) and White (86%), with a mean age of 56, some college education (68%), and (for those who reported it) an income greater than or

TABLE 2. Cost conversation versus no cost conversation on confidence and knowledge outcomes[a]			
Outcomes	Cost	No cost	P^b
DCS overall[c]			.067
N	67	92	
Mean ± SD	10.1±9.7	13.1±10.5	
DCS informed[c]			.064
N	87	95	
Mean ± SD	2.1±2.5	2.8±2.2	
DCS values[c]			.016
N	68	92	
Mean ± SD	2.0±2.1	2.9±2.5	
DCS support[c]			.212
N	87	95	
Mean ± SD	1.7±2.0	2.1±2.1	
DCS uncertainty[c]			.177
N	85	108	
Mean ± SD	2.2±2.4	2.7±2.7	
DCS effective[c]			.947
N	87	95	
Mean ± SD	2.7±3.0	2.7±2.6	
Knowledge			.032
N	105	114	
Mean ± SD	0.6±0.3	0.5±0.3	
OPTION			<.001
N	106	113	
Mean ± SD	16.6±9.0	11.5±8.4	

[a]DCS, decision conflict scale; OPTION, observing patient involvement in decision making.
[b]Student's t-test.
[c]Lower score is a better outcome.

equal to $40,000 per year (75%), and participated in an encounter that was not supported by an SDM tool (52%). Cost conversations occurred in 106 encounters (48%). These cost conversation were more frequent in encounters in the diabetes (32%) and depression (28%) trials, with less-educated patients (40%), and when an SDM tool was used in the encounter (61%).

Compared to encounters without cost conversations, a cost conversation in the encounter was associated with lower DCS values scores (2 vs 2.9, $P=.016$), higher knowledge scores about their condition and treatment options (0.6 vs 0.5, $P=.03$), and higher levels of patient engagement (16.6 vs 11.5, $P<.001$). DCS informed, support, uncertainty, and effective subscales along with the overall score were similar in encounters with and without cost conversations

Outcomes	Cost			No cost			P (between controls)[b]	P (between SDM groups)[b]
	Control group	SDM tool	P[b]	Control group	SDM tool	P[b]		
DCS overall[c]			.084			.043		
N	29	38		57	35		.339	.38
Mean ± SD	12.6±10.7	8.3±8.6		14.9±10.1	10.3±10.6			
DCS informed[c]			.156			.006		
N	37	50		59	36		.191	.68
Mean ± SD	2.5±2.6	1.8±2.4		3.2±2.2	2.0±2.0			
DCS values[c]			.154			.006		
N	29	39		57	35		.071	.41
Mean ± SD	2.5±2.3	1.7±2.0		3.5±2.5	2.1±2.2			
DCS support[c]			.733			.393		
N	37	50		59	36		.230	.68
Mean ± SD	1.8±1.7	1.6±2.2		2.2±1.9	1.8±2.4			
DCS uncertainty[c]			.709			.799		
N	32	53		69	39		.398	.02
Mean ± SD	2.3±2.3	2.1±2.5		2.7±2.4	2.6±3.2			
DCS effective[c]			.344			.061		
N	37	50		59	36		.996	.62
Mean ± SD	3.1±2.9	2.4±3.0		3.1±2.6	2.1±2.4			
Knowledge			.0004			.083		
N	41	64		74	40		.884	.04
Mean ± SD	0.5±0.3	0.7±0.2		0.5±0.3	0.6±0.3			
OPTION			<.001			<.001		
N	41	65		73	40		.173	.009
Mean ± SD	11.1±7.1	20.0±8.4		9.1±8.0	15.7±7.5			

TABLE 3. Groups within cost/no cost conversations for confidence and knowledge outcomes[a]

[a]DCS, decisional conflict scale; SDM, shared decision-making tool.
[b]Student's *t*-test.
[c]Lower score is a better outcome.

(Table 2). In encounters with SDM, having a cost conversation led to lower uncertainty scores (2.1 vs 2.6, P=.02) and higher knowledge (0.7 vs 0.6, P=.04) and OPTION (20 vs 15.7, P=.009) scores than in encounters with SDM where cost conversations did not occur (Table 3). There was a significant difference between the control group and SDM group for those that had a cost conversation for some subscales. Knowledge was significantly higher in the SDM group (0.7 vs 0.5, P<.001), as was the OPTION scores (20.0 vs 11.1, P<.001). For those who did not have a cost conversation during their encounter, the SDM group still scored significantly better in the informed subscale (P=.006), the values subscale (P=.006), and the OPTION score (P<.001) (Table 3).

In the multivariate model we found that who started the cost conversation, whether or not cost issues were addressed, and the (direct or indirect) nature of the cost issues did not significantly impact the overall DCS and OPTION scores; yet, we found that patients reported slightly higher (ie, worse) DCS informed scores when patients initiated cost conversations as opposed to when the clinicians initiated cost conversations. Furthermore, we found higher levels of knowledge when the conversation included indirect cost issues versus direct cost issues (Table 4).

DISCUSSION

Cost conversations between patients and their clinicians did not have a detrimental impact on decision-making outcomes such as decisional conflict, knowledge, and level of patient engagement. In fact, we noted that having cost conversations had positive but minimal impacts on reducing patient uncertainty,

TABLE 4. Linear regression models for confidence and knowledge outcomes, adjusting for factors during the cost conversations[a]

Outcomes	Variable	Cost	
		estimate ± SE	P
DCS overall[b]			
	Intercept	8.12	
	DA	-2.59±2.81	.361
	Indirect cost	-2.44±2.61	.353
	Patient start	3.44±2.92	.242
	Addressed	4.99±2.51	.051
DCS informed[b]			
	Intercept	1.08	
	DA	0.11±0.61	.852
	Indirect cost	0.19±0.61	.760
	Patient start	1.66±0.64	.012
	Addressed	0.50±0.55	.367
DCS values[b]			
	Intercept	1.94	
	DA	-0.54±0.63	.393
	Indirect cost	-0.97±0.58	.101
	Patient start	0.84±0.65	.202
	Addressed	0.72±0.56	.201
DCS support[b]			
	Intercept	1.13	
	DA	0.31±0.52	.556
	Indirect cost	-0.17±0.52	.745
	Patient start	0.99±0.54	.072
	Addressed	0.17±0.46	.721
DCS uncertainty[b]			
	Intercept	1.79	
	DA	-0.12±0.65	.851
	Indirect cost	-0.22±0.63	.722
	Patient start	0.07±0.67	.917
	Addressed	0.92±0.58	.116
DCS effective[b]			
	Intercept	1.79	
	DA	0.24±0.76	.748
	Indirect cost	0.18±0.76	.814
	Patient start	1.58±0.80	.051
	Addressed	0.29±0.68	.667
Knowledge			
	Intercept	0.45	
	DA	0.20±0.06	.001
	Indirect cost	0.13±0.06	.024
	Patient start	-0.07±0.06	.213
	Addressed	0.01±0.05	.894

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		Cost	
TABLE 4. Continued			
Outcomes	Variable	estimate ± SE	*P*
OPTION			
	Intercept	10.42	
	DA	9.32±1.81	<.001
	Indirect cost	3.05±1.87	.106
	Patient start	-1.57±1.92	.415
	Addressed	0.22±1.62	.893

[a]DA, decision aid; DCS, decisional conflict scale; OPTION, observing patient involvement in decision making scores; SE, standard error.
[b]Lower score is a better outcome.

increasing knowledge, and improving patient engagement, particularly when the cost conversations were aided by an SDM tool. This could be because patients who discuss cost issues with their clinicians during the decision-making process (particularly when shared) may have better opportunities to explore how cost, along with other variables, influences which treatment or diagnostic option makes the most intellectual, emotional, and practical sense to them. This finding further aligns with previous studies indicating that decisional (un)certainty and knowledge can be influenced by SDM tools[41] and by patient-clinician interactions and relationships.[42]

We also found that when patients began cost conversations in encounters they experienced a small worsening of their decisional conflict as opposed to when clinicians initiated the conversations. In our multivariate analysis this detrimental effect on decisional conflict persisted regardless of the use or lack of SDM tools. Perhaps the cost conversations raised by patients are different, and covered cost issues or information not portrayed in the SDM tools. This would align with a previous study developed in an oncology setting which found that cost conversations initiated by oncologists most frequently brought up costs for pharmacotherapies, whereas patient-initiated conversations were more concerned about the costs of non-pharmacologic interventions.[43] Without tools to support those conversations about patient-raised cost concerns, patients may feel less supported in or more uncertain about their decisions.

The nature of the cost conversations patients and clinicians shared was shown to affect knowledge scores. In particular, those about indirect costs were associated with increased knowledge scores even after adjusting for the use of SDM tools. This may initially seem surprising, as conversations about indirect costs involve how treatment and disease burdens affect patients' finances through impacts on their social, personal, and work lives (eg, patient productivity/lost wages, administrative burden costs, family impacts, and child/elder care). Thus, it is perhaps initially unclear how such conversations could affect patients' knowledge about their conditions or treatment. However, conversations about indirect costs may require a more holistic understanding of patients and thereby foster better quality interactions between clinicians and patients. Thus, it is likely that the true impact of the (direct or indirect) nature of cost conversations on knowledge is actually the indirect effect of fostering better quality, more holistic conversations that acknowledge patients in an integral way.

Implications for Research and Practice
Our findings alleviate some concerns about the possible detrimental effects of discussing cost with patients and highlight some potential benefits of including costs in the decision-making process.[13,21,44-46] Our findings also reveal other important downstream benefits for patients who discuss costs with their clinicians. For instance, one study showed that half of cost conversations led to at least one cost reduction strategy, and many of these strategies did not necessitate a change in the plan of care.[47] Similarly, cost conversation could better align treatment and diagnostic decisions with patients' financial

capacities, possibly leading to reduced financial burdens and cost-related nonadherence. Despite these potential benefits, conversing about costs in clinical encounters requires more research to address additional barriers such as the following: better identifying which patients most need to discuss costs, what makes a cost conversation helpful, what tools might support clinicians in ameliorating cost issues and how, and how to best document and follow-up on cost conversations.

Study Limitations
Our observational study has several limitations. We used videos recorded during the conduct of several clinical studies; the clinicians and patients who agreed to have their encounters recorded for those studies may have different personal circumstances or communicative preferences than those who declined being recorded. For instance, a patient planning to bring up issues of cost during their encounter may have declined being video recorded due to concerns of being judged. Similarly, the fact that encounters were video recorded could have changed clinicians' behaviors and made them more likely to address issues such as cost; this could explain why several studies have shown that cost conversation frequency is lower in studies using self-reported methods (eg, surveys)[48,49] than those using observed methods (eg, video or audio recording).[10,38,47] Finally, we analyzed only one episode in the continuum of care for our patient participants, and it is possible that previous conversations with their clinicians about cost were not captured in this study.

CONCLUSIONS
Cost conversations have minimal but favorable impacts on clinical decision-making outcomes, particularly when they occur in encounters aided by SDM tools that raise cost as an issue.

SUPPLEMENTAL ONLINE MATERIAL
Supplemental material can be found online at http://mcpiqojournal.org. Supplemental material attached to journal articles has not been edited, and the authors take responsibility for the accuracy of all data.

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