A Video-Intervention to Improve Clinician Attitudes Toward Patients with Sickle Cell Disease: The Results of a Randomized Experiment

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BACKGROUND: Clinician attitudes toward patients are associated with variability in the quality of health care. Attitudes are typically considered difficult to change, and few interventions have attempted to do so. Negative attitudes toward adults with sickle cell disease have been identified as an important barrier to the receipt of appropriate pain management for this patient population.

OBJECTIVE: To test the effect of a video-intervention designed to improve clinician attitudes toward adults with sickle cell disease.

INTERVENTIONS: An 8-minute video depicting a clinician expert and patients discussing challenges in seeking treatment for sickle cell pain.

DESIGN AND PARTICIPANTS: A randomized post-test only control group design was used to assess the impact of the intervention on the attitudes of 276 nurses and housestaff working at a large, urban, academic medical center.

MAIN MEASURES: Attitudes toward adult sickle cell patients assessed using 5- and 6-point Likert-scale items. Exploratory factor analysis was used to identify underlying attitudinal domains and develop scales. Examples of the negative and positive attitudes assessed include clinician estimates of the percentage of SCD patients that exaggerate pain (negative) or make clinicians glad they went into medicine (positive).

KEY RESULTS: Compared to the control group, the intervention group exhibited decreased negative attitudes (Difference in means=-8.9, 95%CI [-14.2, -3.6]; Cohen's d=0.41), decreased endorsement of certain patient behaviors as "concern-raising" (Difference in means=-7.8, 95%CI [-13.1, -2.5]; Cohen's d=0.36), and increased positive attitudes toward sickle cell patients (Difference in means=6.6, 95% CI [0.6, 12.6]; Cohen's d=0.27).

CONCLUSIONS: Our results suggest that the attitudes of clinicians toward sickle cell patients may be improved through a short and relatively easy to implement intervention. Whether the attitudinal differences associated with our intervention are sustainable or are linked to clinical outcomes remains to be seen.

KEY WORDS: healthcare provider attitudes; sickle cell disease; randomized experiment; video interventions.
J Gen Intern Med 26(5):518–23
DOI: 10.1007/s11606-010-1605-5

INTRODUCTION

Research exploring the contribution of clinician attitudes toward the development of racial and ethnic healthcare disparities has been an area of national health priority at least since the 2002 publication of *Unequal Treatment*, the Institute of Medicine's seminal report on the subject.[1] A large body of evidence suggests that clinician attitudes toward patients can vary on the basis of patient characteristics (e.g., race/ethnicity), that these variations can negatively impact healthcare quality, and these attitudes can be complex and difficult to change.[2–6]

Persons with sickle cell disease (SCD), a serious genetic disorder of hemoglobin, constitute a patient population in which clinician attitudes may have a particularly pronounced impact on healthcare quality.[7,8] The most well-known complication of SCD is severe pain. Multiple literature reviews have found that clinician attitudes toward SCD patients serve as a barrier to quality pain management.[9–11] Specific attitudes that have been described by both clinicians and patients include stigmatization of the patients as being addicted to opioids, mistrust of patient reports of pain, a perceived unwillingness to involve patients in the course of their own health care, and a lack of sympathy for patients.[9,12]

Electronic supplementary material *The online version of this article (doi:10.1007/s11606-010-1605-5) contains supplementary material, which is available to authorized users.*

Received July 12, 2010
Revised October 11, 2010
Accepted December 2, 2010

This paper describes the results of a randomized controlled experiment to test a video-intervention designed to improve clinician attitudes toward adult SCD patients.

METHODS

Design

We utilized a randomized post-test only control group design to test the impact of our intervention on clinician attitudes toward adult SCD patients.[13] Eligible participants were clinicians working in the Department of Medicine at a large, urban, academic medical center. Participating nurses were recruited from among those attending a nursing retreat in May 2009. Housestaff (internal medicine residents) were recruited from among those attending a regularly scheduled noon conference. The academic center's institutional review board approved all study procedures. All participants provided informed consent.

Intervention

Our intervention consisted of an 8-minute video that featured an adult hematologist (co-author SL) and three adult SCD patients discussing the challenges that many SCD patients face when seeking treatment for pain. The study participants were randomized to either the intervention or control arm using a computerized random-number table. All participants were given a copy of an attitudinal survey upon entry into a conference room used for the study. Control group participants were asked to complete and return the survey during the first 20 minutes of each session. The video was then shown to all participants. Upon video completion, the intervention group participants were asked to complete and return their surveys.

Measures

For our outcomes, we developed or adapted from extant literature 31 items (see online appendix) assessing attitudes and beliefs such as the percentage of SCD patients who possess certain positive or negative characteristics, the extent to which clinicians possess positive feelings of affiliation toward SCD patients, and the extent to which certain behaviors exhibited by these patients are signs that the patient is drug-seeking.[2,14]

The construct validity of our outcomes was assessed using the previously validated Medical Condition Regard Scale (MCRS), which measures the extent to which respondents find patients with a given medical condition to be enjoyable, treatable, and worthy of medical resources.[15] Clinicians expressing more negative attitudes about SCD patients were hypothesized to exhibit lower regard for these patients as measured by the MCRS. The MCRS was previously shown to possess good reliability (Cronbach's alpha=0.87).

We collected the participating clinician's profession (nurse vs. physician), race, sex, and the number of SCD patients they treated in the past 3 months as potential confounders.

Statistical Analyses

We used the following tests and criteria to check the appropriateness of using factor analysis with our data: a correlation matrix determinant value between 0 and 1; Bartlett's test of sphericity (p-value<0.05); the Kaiser-Meyer-Olkin test (KMO value >0.60); and individual item measures of sampling adequacy (MSA value>0.60).[16] We eliminated items from the analysis until all of the above criteria were met.

Next, we performed a factor analysis on the remaining items by using a principal components analysis (retaining eigenvalues≥ 1), followed by principal axis factoring. We eliminated items with uniqueness values≥ 0.60. We retained those factors that had at least three items with factor loadings$\geq |0.40|$. We generated scale scores from the remaining sets of items by summing the scores on each item within a factor and using a linear transformation to put the scores on a 0 to 100 scale. We assessed the reliability of the resulting scales using Cronbach's alpha.

We used chi-square tests to examine the distribution of clinician characteristics by intervention group, and Pearson correlations to assess the relationship between our attitudinal measures and the MCRS. We used t-tests to examine differences in the mean scores on our measures by intervention group. We calculated both unstandardized (difference in means) and standardized (Cohen's d) effect size measures.[17] We used linear regressions to control for any confounding that may have been induced by the presence of missing variables. Two-sided p-values at a level of≤ 0.05 were used to assess statistical significance. All statistical analyses were conducted using Stata 10.0.

RESULTS

Respondents

We enrolled 276 clinicians (response rate=97.8%). Approximately half (52.5%) were randomized to the intervention group (Table 1). There were no differences in clinician characteristics by intervention group. Nurses comprised 88.5% of the total sample. The majority of participants (68.2%) reported treating

Table 1. Clinician Characteristics by Intervention Assignment (Controls vs. Video Intervention)

	Intervention assignment		
	Control (n=131)	**Intervention (n=145)**	**p-value**
Clinician type, n(%)			0.425
Physician	15(13.3)	13(10.0)	
Nurse	98(86.7)	117(90.0)	
# of patients with VOC[a] treated in past 3 months, n(%)			0.954
0	26(21.3)	34(23.9)	
1 to 10	85(69.7)	95(66.9)	
11 to 20	8(6.6)	10(7.0)	
>20	3(2.5)	3(2.1)	
Male, n(%)	18(15.0)	16(11.5)	0.407
Race/Ethnicity, n(%)			0.746
White(not hispanic)	59(50.9)	74(56.5)	
Black(not hispanic)	35(30.2)	32(24.4)	
Asian	13(11.2)	16(12.2)	
Other	9(7.8)	9(6.9)	

[a] *VOC=Vaso-Occlusive Crisis*

between 1 and 10 SCD patients in the prior 3 months. The racial composition was as follows: 53.9% white, 27.1% African-American, 11.7% Asian, and 7.3% were other races.

Attitudinal Scales

Factor analysis resulted in our retaining 17 of the original 31 items, which separated into 4 subscales with good psychometric properties (Table 2):

Negative Attitudes Scale. Six items grouped together to form what we call a negative attitudes scale (Mean=36.5, SD=21.9, Potential range=0 to 100). Higher scores on this scale indicated an endorsement of more negative views about SCD patients.

Positive Attitudes Scale. Four items grouped together in what we call a positive attitudes scale (Mean=45.7, SD=24.3, Potential range=0 to 100). Higher scores indicated an endorsement of more positive views about SCD patients.

Concern Raising Behaviors Scale. Four items grouped together in what we call a concern raising behaviors scale (Mean=53.7, SD=22.0, Potential range=0 to 100). Higher scores indicated greater endorsement of the belief that certain SCD patient behaviors raise clinician concern that the patient is inappropriately drug-seeking.

Red-Flag Behaviors Scale. Three items grouped together in what we call a red-flag behaviors scale (Mean=58.7, SD=22.7, Potential range=0 to 100). Our psychometric analyses suggested that this scale was distinct from the Concern Raising Behaviors Scale. However, similar to the concern raising behaviors scale, higher scores on this scale indicated greater endorsement of the belief that certain SCD patient behaviors raise clinician concern about patient drug-seeking.

Medical Condition Regard. In this study, psychometric analyses suggested that we split the MCRS into a 3-item positive regard subscale (Cronbach's alpha=0.82) and a 4-item negative regard subscale (Cronbach's alpha = 0.82).

Construct Validity Assessment

The construct validity of our attitudinal scales was supported by their significant correlations with the MCRS in the hypothesized directions (Table 3). Clinicians exhibiting more negative regard toward SCD patients as measured by the negative

Table 2. Factor Loadings for the Final Clinician Attitude Scales (17 items total)

Items	Clinician attitude scales			
	Negative attitudes	Positive attitudes	Concern raising behaviors	Red-flag behaviors
What percentage of patients with Sickle Cell Disease[a]:				
Over-report (exaggerate) pain?	0.687	-	-	-
Fail to comply with medical advice?	0.754	-	-	-
Abuse drugs, including alcohol?	0.735	-	-	-
Manipulate you or other providers?	0.829	-	-	-
Are drug-seeking when they come to the hospital?	0.812	-	-	-
Are frustrating to take care?	0.625	-	-	-
Makes me glad that I went into medicine?	-	0.757	-	-
Are the kind of person I could see myself friends with?	-	0.711	-	-
Are satisfying to take care of?	-	0.844	-	-
Are easy to empathize with?	-	0.747	-	-
Please indicate your opinion about the degree to which each of the following is a sign that a patient with sickle cell disease is inappropriately/unnecessarily drug-seeking[b]:				
Patient requests specific narcotic drug and dose	-	-	0.719	-
Patient appears comfortable (e.g. talking on phone or watching TV) while complaining of severe pain	-	-	0.686	-
Patient has history of disputes with staff	-	-	0.468	-
Patient rings bell for nurse and constantly asks for more pain medication before next dose is due	-	-	0.788	-
Patient changes his/her behavior (e.g. appears in greater distress) when provider walks in room	-	-	-	0.470
Patient has history of signing out against medical advice	-	-	-	0.743
Patient tampers with a patient-controlled analgesia device	-	-	-	0.779

Only factor loadings≥ |0.40| are displayed
Factor 1: Negative attitudes scale (Cronbach's alpha=0.89); Mean inter-item correlation=0.57;
Corrected item-total correlations range from 0.59 to 0.82
Factor 2: Positive attitudes scale (Cronbach's alpha=0.85); Mean inter-item correlation=0.59;
Corrected item-total correlations ranging from 0.64 to 0.78
Factor 3: Concern raising behaviors scale (Cronbach's alpha=0.82); Mean inter-item correlation of 0.53;
Corrected item-total correlations ranging from 0.55 to 0.73
Factor 4: Red-flag behaviors scale (Cronbach's alpha=0.76); Mean inter-item correlation of 0.51;
Corrected item-total correlations ranging from 0.52 to 0.65
[a] *Response options: <5%, 6-20%, 21-50%, 51-75%, >75%*
[b] *Response options: Strongly disagree, Disagree, Not sure but probably Disagree, Not sure but probably Agree, Agree, Strongly agree*

Table 3. Pearson Correlation Matrix Showing the Bivariate Associations Among the Clinician Attitude Scales and the Medical Condition Regard Scale[a]

	Negative attitudes scale	Positive attitudes scale	Concern raising behaviors	Red-flag behaviors
Negative attitudes scale (6-items)	-			
Positive attitudes scale (4-items)	-0.21	-		
Concern-raising behaviors (4-items)	0.56	0.22	-	
Red-flag behaviors (3-items)	0.39	0.36	0.40	-
MCRS[b]: positive (3-items)	-0.33	0.58	-0.22	0.30
MCRS[b]: negative (4items)	0.36	-0.44	0.30	0.29

[a] *All correlations significant at p<0.001*

[b] *MCRS=Medical Condition Regard Scale*

MCRS subscale also exhibited more negative attitudes and beliefs about the patients as measured by our negative attitudes, concern raising behaviors, and red-flag behaviors scale. In contrast, our positive attitudes scale correlated most strongly with the positive MCRS subscale (r=0.58, p<0.001), indicating that clinicians endorsing more positive attitudes toward SCD patients also found them to be more enjoyable, treatable, and worthy of medical resources.

Analyses of the Effect of the Video-Intervention

Significant differences in attitudinal scores between the intervention and control groups were observed for three of our four outcome measures (Table 4). The strongest impact of the intervention was in the reduction of negative attitudes (Difference in means=-8.9, 95%CI [-14.2, -3.6]; Cohen's d=0.41). Intervention group members estimated that fewer numbers of SCD patients exaggerate pain, fail to comply with medical advice, abuse drugs or alcohol, manipulate clinicians, or are drug-seeking when they come to the hospital.

The intervention reduced clinician interpretation of behaviors as concern raising (Difference in means=-7.8, 95%CI [-13.1, -2.5]; Cohen's d=0.36). Intervention group members were less likely view a patient's request for a specific narcotic drug or dose, or a patient's appearance of being comfortable while complaining of pain, as signs that the patient was drug-seeking.

The smallest impact of the intervention was in the increase in positive attitudes toward SCD patients (Difference in means= 6.6, 95% CI [0.6, 12.6]; Cohen's d=0.27). Intervention group members viewed a greater number of SCD patients as being the kind of person that made them glad they went into medicine, or that they could see themselves being friends with.

No difference between the intervention and control groups was detected in the endorsement of certain behaviors as raising "red-flags" that a patient may be inappropriately drug-seeking.

Multivariate analyses of these relationships adjusting for clinician characteristics led to the same conclusions regarding the direction and magnitudes of the intervention effect (not shown).

DISCUSSION

Clinicians and SCD patients alike say that negative clinician attitudes have a major impact on the quality of SCD care. We found evidence to suggest that a brief video-intervention can be used to improve attitudes held by clinicians towards these patients. While multiple interventions to improve the quality of pain management for SCD patients have been tested,[9] we identified only one other study which directly attempted to modify clinician attitudes toward these patients. Jamison and Brown found that a multi-modal intervention to improve the care of SCD patients, which included a provider education and sensitivity training component, led to an increase in patient satisfaction.[18] However, no direct assessment of the impact of these methods on clinician attitudes was provided.

Our intervention demonstrated its strongest impact on the reduction of negative attitudes. The negative attitudes scale asked clinicians to estimate the percentage of SCD patients who possess negative characteristics such as being drug-seeking upon entrance into the hospital. Multiple studies have shown that clinicians tend to overestimate the prevalence of addiction among SCD patients.[8,19,20] Shapiro et al. found that 53% of emergency department physicians, and 23% of hematologists thought that greater than 20% of SCD patients were addicted to analgesics.[19] No studies, however, have shown that these patients are any more likely than other patient populations to be addicted, and estimates of the prevalence of addiction among SCD patients range from 0 to 11%.[21–24] Nevertheless, SCD patients frequently report that clinicians treat them as if they have addiction issues.[12,25–31] Our intervention suggests one potential way to reduce these clinician beliefs.

Our video-intervention reduced the extent to which certain behaviors exhibited by SCD patients were viewed as raising

Table 4. Clinician Attitude Scores by Intervention Assignment (Video Intervention vs. Control)

	Intervention	Control	Difference in Means	Cohen's D[a]	P-value
	Mean (SD)		Intervention – Control (95%CI)		
Negative Attitudes	32.3 (21.2)	41.2 (22.0)	-8.9 (-14.2,-3.6)	0.41	0.001
Concern Raising Behaviors	50.1 (23.2)	57.9 (19.9)	-7.8 (-13.1,-2.5)	0.36	0.004
Positive Attitudes	48.8 (26.6)	42.2 (20.9)	6.6 (0.6,12.6)	0.27	0.029
Red-Flag Behaviors	57.9 (24.5)	59.7 (20.5)	-1.8 (-7.3,3.7)	0.08	0.511

[a] *Cohen's D Effect Size Interpretation:*
0.20=Small Effect
0.50=Medium Effect
0.80=Large Effect

clinician concern that the patient is inappropriately drug-seeking. Elander defines concern-raising behaviors in the context of SCD as observable patient behaviors that clinicians may view as signs that the patient is drug-seeking, but which are equally, if not more, likely to be attributed to inadequacies in the management of the patient's pain.[32,33] In his study, Elander found that concern-raising behaviors were statistically associated with patient attempts to seek relief from their pain, while there was no association between these behaviors and patient behaviors driven by actual substance addiction.[33] In our study, clinicians participating in the intervention group demonstrated a lower level of endorsement of behaviors (such as requesting a specific type and dosage of opioids) as a sign that the clinician should be concerned about drug-seeking.

Nevertheless, our intervention demonstrated no impact in reducing the extent to which one set of behaviors (specifically: a patient appearing to change his or her behavior when a clinician walks into the room, having a history of signing out of a hospital against medical advice, or tampering with patient-controlled analgesia devices) were seen as signs that the patient may be drug-seeking. A number of hypotheses might explain this lack of an effect. For one, these behaviors may truly be more indicative of underlying substance abuse issues among patients, and thus clinicians would be correct in viewing these as "red-flags" for patient drug-seeking. It is interesting to note, though, that we have previously reported that adult SCD patients with a history of leaving a hospital against medical advice were more likely to have reported having difficulty in persuading healthcare providers about their pain, while we found no significant statistical association between self-discharge history and having a positive toxicology screen within the prior 5 years.[34]

Alternatively, these particular "red-flag" behaviors may be *perceived* by clinicians as more indicative of underlying substance abuse issues among patients. If the significance of these particular behaviors differs in degree from other concern-raising behaviors within the perceptions of clinicians, then specially tailored interventions to address these particular beliefs may be required. Future research should assess to what extent underlying substance abuse issues, difficulties in communicating with clinicians about pain, or other potential causes can explain the incidence of these specific behaviors among SCD patients.

Our intervention had a small effect on increasing the positive attitudes that clinicians held toward SCD patients. Our positive attitudes scale asked clinicians to estimate, among other things, the percentage of SCD patients that they could see themselves being friends with. Previous research by van Ryn found that physicians were more likely to rate white than black patients as someone with whom they could see themselves being friends.[2] Other research has found that patients who are not liked by their physicians receive lower quality medical care.[35] Additionally, patients who are respected by their physicians perceive higher quality communication in routine medical encounters than patients who are not respected.[36] Higher perceived quality of clinician communication with SCD patients has been shown to be associated with the amount of trust in clinicians expressed by this population.[37] As the content of our intervention focused on describing the many challenges that adults with SCD can face in seeking treatment for pain, it may not have possessed the content needed to improve clinician feelings of "affiliation" or "liking" toward SCD patients generally. Despite this, the fact that we did observe a small improvement in positive attitudes toward these patients is encouraging.

This study was subject to certain limitations that should be considered when interpreting the results. While our study found statistical differences between the intervention and control groups on 3 of our 4 outcome measures, the clinical significance of these differences is unclear. The majority of the research which has documented clinician attitudes toward patients with SCD has been qualitative in nature. Therefore, it is unclear how quantitative assessments of differences between clinicians in their attitudes toward SCD patients translate into observed differences in the actual quality of care delivered to their patients. Future research should seek to directly estimate this relationship.

As the participants in our intervention group completed the survey immediately after viewing the video-intervention, the duration of the effects observed in this study are unknown. It is possible that periodic "refreshers" are needed to sustain the intervention effect.

The extent to which our findings are generalizable to clinicians working in other treatment settings is unclear. The clinicians participating in our study treat SCD patients in the setting of an academic medical center located in an urban environment. Future research must examine the extent to which the geographic location, environment, healthcare setting, and the institutional culture interact to affect clinician attitudes toward SCD patients as this may have important implications for the content that ought to be included in interventions designed to improve clinician attitudes.

Similarly, as the participants in our study consisted of nurses and internal medicine residents alone, the extent to which our findings are generalizable to other types of clinicians is unknown. It will be important for future efforts in this area to assess the extent to which our intervention may impact the attitudes of attending physicians, emergency department physicians, and emergency department nurses, among others.

We used a randomized post-test only control group design because of its efficiency and the protection it provides against many common threats to internal validity. A limitation of this design is the assumption of the baseline equivalency of the outcome variable between the intervention and control groups.[13] However, as our randomization scheme appeared to induce equivalency between our intervention and control groups on every measured demographic characteristic, we have evidence to support the validity of the assumption of baseline equivalency on our outcome measure as well.

Lastly, it is possible that the changes in clinician attitudes observed in this study may be attributable to a social desirability bias. However, the fact that the attitudinal surveys employed in this study were self-administered and anonymous may have minimized any impact this bias had on our findings.[38]

Despite its limitations, our study suggests that a relatively simple educational intervention can be used to improve clinician attitudes toward patients with SCD. A strength of our intervention was the use of adult patients with the disease describing in their own words the challenges they face in seeking treatment for pain. In our experience, we have found that the only exposure to SCD patients that most clinicians have is when the patient presents during a pain episode, when emotions and frustrations are running high. A higher percentage of clinicians may exhibit less negative attitudes toward this population if they had more opportunities to interact with individuals with the disease outside the immediate patient–clinician dynamic. Clinicians need more opportunities to view individuals with SCD as individuals (not just as patients), and to reflect upon their own reactions to encountering these individuals when they are in pain. Ultimately, we hope that this attitudinal shift will lead to improved quality of care for all patients with the disease.

ACKNOWLEDGEMENTS: *Contributors: Mr. Nigel Noble, the filmmaker who produced our video intervention, significantly contributed to the success of the project.*
Funders: This work was supported by an Osler Center for Excellence institutional award. Dr. Haywood's effort on this project was supported by the Johns Hopkins Clinical Research Scholars Program (5KL2RR025006-03). Dr. Lanzkron's effort on this project was supported by a grant from the National Heart, Lung and Blood Institute (5K23HL083089-03). Dr. Beach's effort on this project was supported by a grant from the Agency for Healthcare Research and Quality (K08 HS013903-05). Drs. Beach and Hughes were also supported as Blaustein Scholars through the Johns Hopkins Berman Institute of Bioethics.
Prior presentations: The main findings of this paper were presented during oral presentations given at the following conferences 1) Sickle Cell Disease: The Next 100 Years (April 14th - April 16th, 2010); and 2) the 33 rd Annual Meeting of the Society of General Internal Medicine (April 28th – May 1st, 2010).

Conflicts of Interest: *None disclosed.*

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