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Ian M. Singleton

Rachel J. Garfinkel

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Mohan V. Belthur

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Determinants of caregiver satisfaction in pediatric orthopedics

Ian M. Singleton^a, Rachel J. Garfinkel^b, Jason B. Malone^c,
M'hamed H. Temkit^d and Mohan V. Belthur^d

This study investigates determinants of pediatric orthopedic surgery patients' parent or guardian (caregiver) satisfaction with the physician in an outpatient office setting. This was a cross-sectional survey study of 200 English-speaking caregivers of pediatric patients that checked into the pediatric orthopedic clinic at the authors' institution from 1 March 2017 to 1 November 2018. Questionnaires given in clinic include the Newest Vital Sign and The Literacy in Musculoskeletal Problems survey to measure general and musculoskeletal health literacy, respectively, demographic information, expected/estimated wait time, Consultation and Relational Empathy Measure, and Consumer Assessment of Healthcare Providers and Systems Clinician and Group. After multivariate regression, only perceived physician empathy as measured by the Consultation and Relational Empathy Measure score was significantly correlated with caregiver satisfaction ($P < 0.0001$), accounting for 56% of the variability of caregiver satisfaction scores. The odds of a satisfaction score of at least 9 out of 10 were 21% higher for every unit increase of the Consultation and Relational Empathy Measure score [odds ratio = 1.21 ($P < 0.0001$)].

Introduction

With healthcare transitioning from volume-based to value-based care, patient satisfaction is becoming increasingly reported publicly and tied to physician reimbursement [1,2]. Centers for Medicare & Medicaid Services through the Hospital Value-Based Purchasing Program withholds 2.0% of Medicare Severity Diagnosis-Related Group payments and redistributes it based on specific quality domains, including patient satisfaction as measured by the Hospital Consumer Assessment of Healthcare Providers and Systems survey [1]. Through this program poor performance can significantly affect a hospital's Medicare reimbursement.

Aside from its use as a quality metric, patient satisfaction is also a key component of patient-centered care and health outcomes as well as increased physical and mental health [1,3]. Systematic reviews of studies linking patient satisfaction to outcomes have determined that patient experience is positively associated with patient safety, clinical effectiveness, adherence to recommended clinical practice and medication, as well as lower overall resource utilization [4–10]. In addition, increased

After logistic regression, the caregiver's gender was also correlated with patient satisfaction and the odds of a patient satisfaction score ≥ 9 for males was less than 1/4th that of females [odds ratio = 0.16 ($P = 0.040$)]. The most important determinant of caregiver satisfaction with the physician in an outpatient pediatric orthopedic setting is perceived physician empathy. This accounts for the majority of the caregiver's satisfaction. This is the first study to determine this relationship in pediatric orthopedic surgery. *J Pediatr Orthop B XXX: 000–000* Copyright © 2020 Wolters Kluwer Health, Inc. All rights reserved.

Journal of Pediatric Orthopaedics B 2020, XXX:000–000

Keywords: caregiver, empathy, pediatric orthopedic surgery, pediatrics, satisfaction

^aUniversity of Arizona College of Medicine, Phoenix, ^bHenry Ford Health System, ^cNemours Children's Health System and ^dPhoenix Children's Hospital

Correspondence to Mohan V Belthur, MD, FRCS, Department of Orthopedics, Main Building, Clinic B, Phoenix Children's Hospital, 1919 E Thomas Road, Phoenix, Arizona 85016

Tel: +602 933 5259; fax: +602 933 4311;
e-mail: mbelthur@phoenixchildrens.com

Received 5 May 2020 Accepted 18 June 2020

interpersonal satisfaction leads to less malpractice suits on the part of the patient and less burnout on the part of the physician [11,12].

Previous studies have shown a correlation between perceived physician empathy and patient satisfaction in the primary care setting, but research on patient satisfaction in specialty pediatric care as it relates to the parent or guardian (caregiver) is scarce [13,14]. This is the first study that investigates how factors both intrinsic to the caregiver such as demographics and health literacy, as well as extrinsic such as wait time and physician empathy determine caregiver satisfaction with the physician in outpatient pediatric orthopedic surgery.

Materials and methods

This was a cross-sectional survey study of 200 English-speaking caregivers of pediatric patients that checked into the pediatric orthopedic clinic at the authors' institution from 1 March 2017 to 1 November 2018. Caregivers were defined as the parent or legally approved guardian accompanying the pediatric patient on their visit. All new and follow-up patients presenting to the clinic during

this time period were asked to participate in the study. Follow-up patients were asked if they had previously filled out the packet and if so were not given the forms again. Preoperative and postoperative patients were not included. In order to maximize generalizability, all general pediatric orthopedic clinic patients were included in the study, encompassing the full range of complaints that normally fall under the purview of a pediatric orthopedic surgeon including trauma follow-up visits. The only issue not seen in this clinic was cerebral palsy patients with significant complexity who were seen in a specialized clinic outside of general pediatric orthopedics.

This study was determined by the authors' institutional review board to be quality improvement and therefore exempt from an institutional review board review. No identifying information was collected from patients or their caregivers as part of their participation.

After a medical assistant roomed the patient, the study investigators obtained informed consent and Health Insurance Portability and Accountability Act consent from the caregivers. They were given a demographic survey which included the chief complaint, patient age, and whether the caregiver had ever worked in a healthcare field. The newest vital sign (NVS) and the literacy in musculoskeletal problems (LiMP) surveys were given to measure general and musculoskeletal health literacy, respectively. Originally designed for primary care, but now utilized in a variety of settings, the NVS is a validated tool that was developed to evaluate a patient's overall health literacy using a standard nutrition label about which the patient is asked six questions [15,16]. A significant strength of the tool is that it can be administered in approximately 3 minutes [15]. The LiMP is a self-administered, nine question validated survey specifically designed to measure musculoskeletal health literacy. Its themes of anatomy, terminology, diagnosis, and treatment for musculoskeletal injuries were based off the most emphasized information found in the patient education section of the American Academy of Orthopedic Surgeons website [17]. For the NVS, adequate health literacy is defined as an NVS score of 4 to 6 (group 3), with less than 4 indicating the possibility of limited health literacy (group 2 equals a score of 2–3, and group 1 equals a score of 0–1) [15]. For the LiMP survey adequate musculoskeletal literacy was defined as scores greater than or equal to 6 [17].

After these forms were filled out the physician completed the visit. Although different residents saw each patient, the same attending physician saw all the patients included in the study. After the visit was complete, but before leaving the room the caregiver completed the consultation and relational empathy (CARE) measure to determine perceived physician empathy, and the Clinician and Group Consumer Assessment of Healthcare Providers and Systems (CG-CAHPS). The CARE measure is a patient-rated measure of the

interpersonal skills and relational empathy of health-care practitioners and has been validated for both primary and specialty care [18]. It asks how the healthcare provider performed in 10 categories, such as 'showing genuine compassion and care' and 'letting you tell your "story"' [18]. Five responses were available ranging from 'poor' to 'excellent', with 'poor' being assigned 1 point and 'excellent' 5 points. The scores for the 10 items were then summed, yielding a minimum score of 10 and a maximum score of 50, with higher scores indicating greater empathy. CG-CAHPS is a standardized survey instrument developed by the Agency for Healthcare Research and Quality to assess patients' experience and perception of care in an ambulatory office setting [19]. Particular attention was paid to question 25, which asks the caregiver to rate their satisfaction with the provider on a scale from zero to ten, with zero being 'worst possible provider' and ten being 'best possible provider' [20]. Caregiver age, gender, race, level of education, and self-rated mental/emotional health were also taken from this questionnaire. Also completed was the wait time questionnaire, which asked the caregiver to estimate the time spent waiting for the surgeon, if the surgeon appeared rushed, how long the surgeon spent in the room, or if a resident or physician assistant was involved in their care. The true wait time was calculated from the time the patient checked in at the front office to when the surgeon entered the room.

Statistical analysis

The data were summarized using frequencies and proportions for categorical variables and mean, SD, median, first, third quartiles, and range for quantitative variables. The group comparisons were conducted using the Wilcoxon rank-sum or the Kruskal–Wallis tests for quantitative variables and the chi-squared test for categorical variables. The multivariate regression model for caregiver satisfaction score was obtained by entering the risk factors with $P < 0.20$ in the univariate analysis. The results were summarized using the mean estimates, SE, and P for the categorical variables and the slope, SE, and the P for the quantitative variables.

Multivariate logistic regression was then used to model the odds of caregiver score ≥ 9 , obtained by entering the risk factors with $P < 0.20$ in the univariate analysis. The results are summarized using the odds ratios, 95% confidence intervals, and the P value.

A comparison analysis was also conducted using the Wilcoxon rank-sum test for quantitative variables and the chi-squared test for categorical variables to test all of the variables collected for difference in characteristics between the group who completed the packet aside from the satisfaction score and the group who completed the full packet with the satisfaction score.

The significance level was set at 0.05.

Results

The mean caregiver satisfaction score was 8.7 out of 10 with a SD of 1.8. A list of possible risk factors for the dichotomized caregiver satisfaction (satisfaction score <9 versus satisfaction score ≥9) were included in the study (Table 1). Risk factors found to be significantly associated with the dichotomized caregiver satisfaction score were perceived physician empathy ($P < 0.0001$), if the doctor was subjectively qualified as rushed by the caregiver ($P = 0.0007$), if the caregiver was male ($P = 0.0211$), and estimated wait time per the caregiver ($P = 0.031$).

However, after multivariate regression, only the CARE score was significantly correlated with caregiver

satisfaction [0.15 ($P < 0.0001$)] (Table 2). After adjusting for the other factors in the model, the CARE score alone accounted for 56% of the variability of caregiver satisfaction scores (Fig. 1).

A multivariate logistic regression model was also constructed to determine which factors were associated with caregiver satisfaction scores of 9 or above (Table 3). The CARE score was once again significantly correlated and the odds of a caregiver score of at least 9 were 21% higher for every unit increase of the CARE score [odds ratio = 1.21 ($P < 0.0001$)]. However, in this model caregiver gender was correlated with caregiver satisfaction as well and the odds of a caregiver satisfaction score ≥9 for males

Table 1 Descriptives by caregiver satisfaction

	No (N = 39)	Yes (N = 83)	Total (N = 122)	P value
Male				0.0211 ^a
No	27 (69.2%)	72 (86.7%)	99 (81.1%)	
Yes	12 (30.8%)	11 (13.3%)	23 (18.9%)	
Level of education				0.8639 ^a
≤High school	8 (22.2%)	20 (24.7%)	28 (23.9%)	
High school of ged	13 (36.1%)	26 (32.1%)	39 (33.3%)	
Some college or 2-year degree	9 (25.0%)	17 (21.0%)	26 (22.2%)	
≥4-year college	6 (16.7%)	18 (22.2%)	24 (20.5%)	
White				0.9404 ^a
No	11 (30.6%)	25 (31.3%)	36 (31.0%)	
Yes	25 (69.4%)	55 (68.8%)	80 (69.0%)	
Hispanic				0.8812 ^a
No	28 (75.7%)	61 (74.4%)	89 (74.8%)	
Yes	9 (24.3%)	21 (25.6%)	30 (25.2%)	
Caregiver works in healthcare				0.6010 ^a
No	28 (71.8%)	55 (67.1%)	83 (68.6%)	
Yes	11 (28.2%)	27 (32.9%)	38 (31.4%)	
Doctor rushed				0.0007 ^a
No	31 (79.5%)	80 (97.6%)	111 (91.7%)	
Yes	8 (20.5%)	2 (2.4%)	10 (8.3%)	
PA or resident involved				0.1997 ^a
No	10 (25.6%)	13 (15.9%)	23 (19.0%)	
Yes	29 (74.4%)	69 (84.1%)	98 (81.0%)	
NVS group				0.5081 ^a
Inadequate literacy	8 (20.5%)	13 (15.7%)	21 (17.2%)	
Adequate literacy	31 (79.5%)	70 (84.3%)	101 (82.8%)	
LiMP group				0.3788 ^a
Inadequate literacy	19 (48.7%)	33 (40.2%)	52 (43.0%)	
Adequate literacy	20 (51.3%)	49 (59.8%)	69 (57.0%)	
Caregiver mental/emotional health				0.5992 ^a
Excellent	16 (41.0%)	44 (53.0%)	60 (49.2%)	
Very good	14 (35.9%)	24 (28.9%)	38 (31.1%)	
Good	7 (17.9%)	13 (15.7%)	20 (16.4%)	
Fair to poor	2 (5.1%)	2 (2.4%)	4 (3.3%)	
Patient age (months)				0.1665 ^b
N	38	83	121	
Mean (SD)	71.5 (55.0)	89.6 (64.4)	83.9 (61.9)	
Estimated wait time (minutes)				0.0310 ^b
N	39	81	120	
Mean (SD)	32.7 (31.2)	26.8 (34.7)	28.7 (33.6)	
True wait time (minutes)				0.1103 ^b
N	39	80	119	
Mean (SD)	53.0 (26.8)	47.0 (32.1)	48.9 (30.5)	
Time spent with doctor (minutes)				0.9536 ^b
N	39	80	119	
Mean (SD)	13.1 (6.5)	13.8 (8.6)	13.5 (8.0)	
CARE score				<0.0001 ^b
N	39	82	121	
Mean (SD)	35.6 (9.5)	46.3 (5.9)	42.8 (8.8)	

No: caregiver satisfaction <9 and Yes: caregiver satisfaction ≥9.

CARE, Consultation and Relational Empathy Measure; LiMP, Literacy in Musculoskeletal Problems; NVS, Newest Vital Sign.

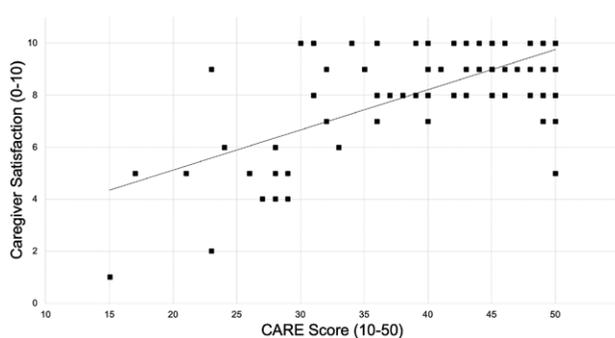
^aChi-square test.

^bWilcoxon rank-sum test.

Table 2 Multivariate regression results for caregiver satisfaction

Risk factor	Mean (SE), slope (SE)	P value
Doctor rushed		0.2602
No	8.65 (0.18)	
Yes	8.10 (0.48)	
PA or resident involved		0.6706
No	8.31 (0.33)	
Yes	8.44 (0.28)	
NVS group		0.9251
Likelihood of inadequate literacy	8.36 (0.37)	
Adequate literacy	8.39 (0.24)	
Estimated wait time	-0.0028 (0.0035)	0.4231
CARE score	0.15 (0.015)	<0.0001

CARE score, Consultation and Relational Empathy Measure; NVS, Newest Vital Sign.

Fig. 1

Caregiver satisfaction plotted against perceived physician empathy as measured by Consultation and Relational Empathy Measure (CARE) scores. N = 122.

were less than 1/4th that of females [odds ratio = 0.16 ($P = 0.040$)]. The area under receiver operating characteristic was 0.89; hence, this multivariate logistic model is able to highly discriminate between satisfaction scores of ≥ 9 versus caregiver scores of < 9 .

Of the 200 packets collected in clinic, 122 caregiver satisfaction scores were complete and included in this study. Every variable collected in the study was examined in the comparison analysis between the group with non-missing satisfaction score ($n = 122$) versus the group with a missing score for satisfaction ($n = 78$) and this analysis showed no statistical difference in characteristics between the two groups

Discussion

The main determinant of caregivers' satisfaction with the physician in an outpatient pediatric orthopedic setting is perceived physician empathy as measured by the CARE score. This accounts for over half of the variation in caregivers' satisfaction with the physician, with the odds of receiving a high satisfaction score increasing proportionally with an increase in perceived empathy. Male gender of the caregiver was associated with lower odds of the physician receiving a satisfaction score of nine or ten out

Table 3 Multivariate logistic regression results for caregiver satisfaction greater or equal to nine out of ten

Risk factor	OR (95% CI)	P value
Male vs. female	0.16 (0.05–0.56)	0.0040
Doctor rushed vs. not	1.61 (0.16–16.17)	0.6865
PA or resident involved vs. not	1.13 (0.29–4.44)	0.8645
Patient age	1.01 (1.002–1.021)	0.0197
Estimated wait time	0.999 (0.98–1.016)	0.8670
True wait time	0.990 (0.970–1.011)	0.3537
CARE score	1.21 (1.12–1.32)	<0.0001

CARE score, Consultation and Relational Empathy Measure; CI, confidence interval; OR, odds ratio.

of ten and was less than 1/4th the odds of the physician receiving the same score from a female caregiver. The demographics of the caregiver, health literacy, wait time, time spent with the surgeon, or if the surgeon seemed rushed were not significantly associated with a caregiver's physician satisfaction.

This importance of physician empathy is in line with previous research on the subject. After controlling for confounding effects, Parrish *et al.* [21] found patient-rated surgeon empathy accounted for 34% of the variation in satisfaction, while Menendez *et al.* [22] found greater empathy to account for 65% of the variation in satisfaction scores in orthopedic hand surgery. Chaitoff *et al.* [23] similarly found overall provider rating to be significantly associated with subjective scores of physician empathy. This study also validates prior studies showing the minimal contribution of time spent with the patient to satisfaction in specialty care [24–26]. Teunis *et al.* [26] found that time seeing an orthopedic hand surgeon is not associated with patient satisfaction. Parrish *et al.* [21] showed that patient satisfaction was correlated with physician empathy rather than either visit duration or revisit expectation of length. Many physicians inherently feel that if they spend more time with patients during visits this will increase the patient's perception of their care, however, this has found to be more true of patients in primary rather than specialty care [27]. These findings highlight the importance of effective interpersonal communication skills of the physician.

Although previous studies have examined patient satisfaction in adult orthopedic patients, this study is unique as it is the first study, to our knowledge, that has explicitly found perceived physician empathy to be the most important factor in pediatric specialty care. Peng *et al.* [28] and Singh *et al.* [29] in pediatric orthopedics and neurology, respectively, while determining physician interpersonal skills to be important for physician satisfaction, found attributes of the office staff and practice independent of the physician to be more significantly associated. Ahmed *et al.* [30] in pediatric dermatology likewise found the cheerfulness of the practice to be more important for satisfaction than patient confidence in the care provider. Our study is more in line with previous findings that in adult orthopedic patients physician empathy is the most important determinant of satisfaction.

In addition, while other studies in this area have not found gender to be significant in determining physician satisfaction in adult patients, our study is the first to find that it impacts the caregivers of pediatric patients, with male caregivers far less likely to be highly satisfied with the physician. This contrasts with the findings of Parrish *et al.* [21] and Menendez *et al.* [22] who did not find gender to be significantly associated with physician satisfaction in adult orthopedic patients. Although this could be due to a potential difference in physician characteristics that male and female caregivers hold in value, or possibly that male caregivers are more likely to agree to provide feedback when they feel that the experience was a negative one, more research is required to confirm this finding and determine its cause and significance.

As patient satisfaction continues to become tied to physician reimbursement, hospitals and private practices that are reviewing methods to increase satisfaction may consider physician or resident education on increasing demonstrated empathy in patient interactions, especially through empathic communication [31–36]. Mjaaland *et al.* [37] showed that empathetic responses were observed less than 30% of the time after patients expressed negative emotions or concerns similarly across all medical specialties aside from psychiatry. They found that, in particular, surgeons rather than passively ignoring the emotional cues given would often actively redirect the patient to a different topic [24]. Other studies have also shown that overall physicians reduce attention to emotional issues that patients express [34,38–40]. However, a review by Zimmermann *et al.* [41] showed that communication training is able to improve physicians' empathic communication. In addition, Banka *et al.* [1] showed that providing patient satisfaction education to residents through conferences, real-time individualized patient satisfaction score feedback, monthly recognition, and incentives for high patient satisfaction scores significantly increased patient satisfaction as measured by the Hospital Consumer Assessment of Healthcare Providers and Systems survey. Hospital departments and private practices wishing to improve their patient satisfaction scores can consider implementing these programs. Residency programs seeking to prepare their graduates for the ongoing transition to value-based care would do well to include communication skills training in the residency curriculum and emphasize doctor-patient interactions that maximize perceived empathy.

There are some potential limitations to our study, foremost that the physician was aware of the ongoing study. Although the physician was not explicitly told which caregivers were asked to participate in the study, surveys were handed out on random clinic days during random weeks, only approximately a fourth of caregivers from any one clinic day agreed to participate, and the study took place over the course of eighteen months, this still may have influenced the physician to subconsciously

alter their behavior to increase patient satisfaction. Furthermore, the response rate of approximately 25% is low, although per Keeter *et al.* [42] a 25% response has only a minimal increase in nonresponse bias when compared with a response rate of 50%. In addition, this study examined the perceived physician empathy of the caregiver accompanying the pediatric patient in an orthopedic subspecialty and may have limited generalization to other medical specialties, including other areas of orthopedic surgery or general pediatrics. Lastly, we had a lower than expected percentage of patients who completely filled out the CG-CAHPS. Although the group comparison showed no statistical difference in any variable or characteristic between the group that completed the full packet including the CG-CAHPS and the group that completed the packet with the exclusion of the CG-CAHPS, a possible solution would be to use only the questions from the CG-CAHPS that are relevant to the study and eliminate the additional superfluous questions to shorten the survey. Lastly, having one attending physician in this study did not allow for the determination of a difference in caregiver satisfaction between male and female physicians. A future study to confirm the findings in this study and address these limitations would include multiple attendings, with at least one being female.

In conclusion, the main determinant of caregiver satisfaction with the physician in an outpatient pediatric orthopedic setting is perceived physician empathy. This accounts for over half of the caregivers' satisfaction with the physician. Male gender of the caregiver was found to be negatively correlated as well. Other demographics of the caregiver, health literacy, wait time, time spent with the surgeon, or if the surgeon seemed subjectively rushed were not significantly associated with a caregiver's physician satisfaction. This is the first study to find perceived physician empathy to be the most important determinant of caregiver satisfaction in outpatient pediatric orthopedic surgery.

Acknowledgements

Conflicts of interest

Rachel Garfinkel, MD is a paid consultant for DePuy Synthes Johnson & Johnson. All the other authors have no conflicts to declare.

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