

Wait Times in Musculoskeletal Patients: What Contributes to Patient Satisfaction

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Abstract

Introduction: The purpose of this study was to determine how wait time duration is associated with patient satisfaction and how appointment characteristics relate to wait time duration and patient satisfaction in the orthopedic surgery clinic. **Methods:** Two hundred sixty-four patients visiting one of 3 ambulatory orthopedic surgery clinics were asked to estimate their wait time and to rate their satisfaction with the visit. The associations between appointment characteristics, wait time, and satisfaction were analyzed using *t* tests, 1-way analysis of variance, and Pearson correlation coefficients. **Results:** Wait times were significantly different based on visit type, appointment time, whether an X-ray was required, and whether a trainee was involved ($P < .001$). Patients with wait times less than 30 minutes had higher satisfaction scores ($P < .001$). Satisfaction ratings were significantly different based on the surgeon's management recommendation ($P = .021$), but were not significantly different based on sex, age, office location, visit type, appointment time subsection, or time spent with the physician ($P > .05$). **Conclusion:** Wait times negatively correlated with satisfaction. New patient visits, appointment times in the later third of the day, appointments requiring an X-ray, and appointments involving a trainee had significantly longer wait times. Care should be taken to inform patients with visits involving these characteristics that they may experience longer than average wait times.

Keywords

wait times, patient satisfaction, outpatient satisfaction data, patient expectations

Introduction

Patient satisfaction has become an increasingly important parameter in health care. Satisfaction data are used for hospital and physician assessment, accreditation requirements, and determining reimbursement rates (1). Minimization of time spent in the waiting room has been associated with improved patient satisfaction in several clinical settings (2–5). In primary care practices, time spent with the physician has also been shown to influence patient satisfaction (2,6,7). In orthopedic clinics, time spent with the physician has not proven as important (8–10).

Previous studies evaluating patient satisfaction in orthopedic clinics have focused on qualities related to the physician and the physician–patient interaction, such as the physician's surgical proficiency or bedside manner, along with patient demographics. These studies have found that factors such as patient age, marital status, and perception of physician empathy may be associated with patient satisfaction (8,10,11). Few studies have addressed the relationship between appointment-related factors, such as

the patient's visit type or appointment time, and satisfaction (1,6). Although several studies have identified an association between office wait time and patient satisfaction, few studies have investigated which office-related factors affect that time.

As wait time duration has frequently been associated with patient satisfaction, determining which factors influence wait times in orthopedic clinics is important for shaping patient expectations. The purpose of this study is to determine how appointment characteristics relate to the wait time duration to see the surgeon and patient satisfaction in the orthopedic clinic. We tested the primary null hypothesis that

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appointment characteristics are not associated with wait duration or patient satisfaction.

Methods

Study Design

After receiving approval from the institutional review board, patients visiting one of 3 ambulatory offices of one orthopedic surgeon were asked to participate in the study. Patients were included in the study if they were 14 years or older, English-speaking, and had the ability to give informed consent. Patients were enrolled during the 2 days per week that the surgeon saw patients in clinic. Enrollment lasted 12 weeks. Patients gave informed consent while waiting for their scheduled appointment.

Patient demographic and appointment data were recorded by a research assistant not directly involved in patient care. The data recorded included age, sex, appointment time, time of arrival, time spent in X-ray (if applicable), time placed in examination room, time surgeon or trainee entered examination room, time the surgeon or trainee exited the examination room, physician recommendation, and time of departure. Appointment time was sectioned by thirds and divided into 3 groups (early, middle, late). At the time of departure, the patient was asked by the research assistant to estimate the time they spent waiting until they were seen by the surgeon within a 5-minute interval (0-5, 6-10, 11-20, or 20+ minutes). Patients were also asked to rate their satisfaction with the visit on a scale of 0 to 10 (with 0 representing extremely unsatisfied with the visit and 10 being the extremely satisfied). Additionally, each patient's appointment duration was retrospectively collected from the electronic medical record (EMR) for comparative use.

The primary outcome measures were appointment wait time and patient satisfaction. Wait time was measured from the time the patient arrived at the clinic to the time they were seen by the surgeon. The explanatory variables measured were visit type, appointment time, appointment location, whether an X-ray was required, and whether the patient was seen by a trainee in addition to the surgeon.

Statistical Analysis

The association between the 2 outcome variables and their individual associations with the explanatory variables were analyzed using independent sample *t* tests and 1-way analysis of variance for categorical variables. Continuous variables were analyzed using Pearson correlation coefficients. Linear regression was used to evaluate the predictive value of wait time on satisfaction. Statistical values were calculated using R version 3.4.0 (R Foundation for Statistical Computing, Vienna, Austria) (12) with R studio version 1.0.153 (R Studio Inc, Boston, Massachusetts) (13).

Table 1. Demographic Information.

Sex, male:female, n	119:145
Age, years, average \pm SD	51.2 \pm 18.5
Wait time, minutes, average \pm SD	34.4 \pm 19.5
Wait time (EMR), minutes, average \pm SD	109.5 \pm 156.6
Appointment time, n (%)	
Early	94 (36)
Middle	87 (33)
Late	83 (31)
Visit type, n (%)	
Established	111 (42)
New patient visit	76 (29)
Postoperative	77 (29)
Physician recommendation, n (%)	
Imaging	19 (7)
Physical therapy	86 (33)
Injection	46 (17)
Surgery	35 (13)
Counseling/observation	78 (30)

Abbreviation: EMR, electronic medical record.

Results

Demographics

A total of 264 patients were included in this study, including 119 (45%) males and 145 (55%) females (Table 1). Average age was 51.2 \pm 18.5 years. Patients had primarily shoulder and knee complaints.

Wait Times

The average wait time from patient check-in to the time the surgeon entered the examination room was 34.3 \pm 19.5 minutes. The average wait time recorded in the EMR was 109.5 \pm 156.6 minutes. Wait times were significantly different based on visit type ($P < .001$), with new patient visits having the longest average wait time (41.8 minutes) and established patient visits having the shortest average wait time (28.8 minutes; Table 2). Wait times were also significantly different based on appointment time subsection ($P < .001$), with patients in the late group having the longest average wait time (38.8 minutes) and patients in the early group having the shortest average wait time (28.4 minutes). Additionally, wait times were significantly longer for patients who required radiographs ($P < .001$), were seen by a trainee prior to the attending surgeon ($P < .001$), and who arrived early or on time ($P < .001$). The average time spent obtaining radiographs was 6.3 minutes, and the average amount of time the trainee spent in the examination room was 5.2 minutes. Wait times were not significantly different based on office location ($P = .824$).

Patient Satisfaction

The average overall patient satisfaction rating was 9.2 \pm 1.5 on a scale of 10. Patients with wait times less than or equal to 30 minutes had significantly higher satisfaction scores than

Table 2. Appointment Parameters in Relation to Wait Time.

Parameter	Number of Patients	Mean Wait Time (Minutes)	P Value
Time subsection			
Early	94	28.4	.0009 ^a
Middle	87	36.3	
Late	83	38.8	
Visit type			
Established	111	28.8	<.0001 ^a
New patient visit	76	41.8	
Postoperative	77	34.9	
Patient arrival			
Early/on-time	212	36.8	<.0001 ^a
Late	52	24.3	
X-ray			
Yes	93	42.8	<.0001 ^a
No	171	29.4	
Seen by trainee			
Yes	131	40.5	<.0001 ^a
No	133	27.8	

^aStatistically significant value.

patients with wait times greater than 30 minutes ($P < .001$; Table 3). Average satisfaction ratings were 9.7 of 10 and 8.8 of 10, respectively. Linear regression showed a significant predictive value of wait time on satisfaction ($R^2 = 0.21$, $P < .001$; Figure 1). Additionally, satisfaction ratings were significantly different based on the surgeon’s management recommendation ($P = .0211$). Patients who received an injection during their visit had the lowest average satisfaction ratings (8.7/10), and patients who were recommended diagnostic imaging had the highest ratings (9.6/10). Satisfaction ratings were not significantly different based on sex, age, office location, visit type, appointment time subsection, or time spent with the surgeon ($P > .05$).

Wait Time Recall

Satisfaction ratings were significantly different based on patients’ recall estimates of their wait time ($P < .001$). Patients who recalled waiting 0 to 5 minutes had the highest average satisfaction rating (9.9/10). Patients who recalled waiting greater than 20 minutes had the lowest average satisfaction ratings (7.2/10). Satisfaction ratings were also significantly different based on the relation of their recall estimate to the actual time they waited. Patients who under- or overestimated their wait time had higher satisfaction ratings (9.6/10 and 10/10, respectively) than those who correctly estimated their wait time (7.6/10).

Discussion

Our study demonstrated that longer wait duration negatively correlated with patient satisfaction, suggesting that time spent in the waiting room is important to patients in the orthopedic surgery clinic. This conclusion has been

Table 3. Patient and Appointment Parameters in Relation to Satisfaction.

Parameter	Number of Patients	Mean Satisfaction Rating	P Value
Age ($r = 0.06$)			.36
Sex			
Male	119	9.29	.395
Female	145	9.13	
Wait time ($r = -0.5$)			<.0001 ^a
Wait time			
≤30 minutes	127	9.7	<.0001 ^a
>30 minutes	137	8.8	
Wait time recall			
0-5 minutes	84	9.9	<.0001 ^a
6-10 minutes	88	9.7	
11-20 minutes	52	8.9	
>20 minutes	40	7.2	
Recall estimate			
Underestimated	212	9.6	<.0001 ^a
Overestimated	3	10	
Correct estimate	49	7.6	
Time subsection			
Early	94	9.4	.0508
Middle	87	9.3	
Late	83	8.9	
Visit type			
Established	111	9.3	.35
New patient visit	76	9	
Postoperative	77	9.2	
Recommendation			
Imaging	19	9.63	.0211 ^a
Physical therapy	86	9.02	
Injection	46	8.73	
Surgery	35	9.37	
Counseling/observation	78	9.51	
Time spent with physician ($r = 0.005$)			.934

^aIndicates statistically significant value.

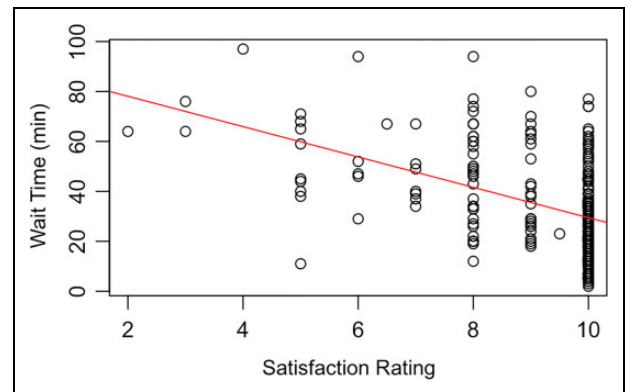


Figure 1. Linear regression plot of wait time (minutes) versus patient satisfaction with clinic appointment (measured by rating scale of 0-10, with 10 being the most positive experience).

demonstrated in previous studies involving both primary care and specialty clinics in which a longer wait time decreased patient satisfaction with the office visit (2–5). In our study, patients who waited longer than 30 minutes had significantly lower satisfaction scores. Likewise, patients who recalled waiting longer than 20 minutes gave significantly lower satisfaction scores. However, patients were overall very satisfied with their visit (average rating 9.2/10) regardless of differences in age, sex, office location, time of appointment, visit type, or time spent with surgeon, though satisfaction ratings were significantly different based on physician recommendation.

The lack of an association between time spent with the physician and patient satisfaction has been similarly reported in other studies involving orthopedic surgery practices (8–10). This finding contrasts with reports in the primary care setting, which have demonstrated that time spent with the physician is an important parameter in patient satisfaction, sometimes more important than time spent in the waiting room (2,7). Teunis et al, in a report on patient satisfaction in a hand surgery clinic, speculated that the time spent with the physician may be less important to patients with focused problems, who may instead appreciate efficiency (8). Both Parrish et al and Menendez et al found that patient-rated surgeon empathy was associated with higher patient satisfaction in hand surgery clinics (9,10). Additionally, Menendez et al found that the management decision (operative, non-surgical, diagnostic test, or counseling/observation) was not associated with patient satisfaction (10). Our study demonstrated a different result. We found that the physician recommendation of diagnostic imaging, physical therapy, injection, surgery, or observation was associated with differences in patient satisfaction. Patients in our study had the highest average satisfaction ratings with the least invasive management recommendations (diagnostic imaging and counseling/observation) and had the lowest average satisfaction ratings when they received an injection. Our findings, in addition to those of Parrish et al and Menendez et al, suggest that in a specialty clinic, outside of wait duration, patient satisfaction may depend both on the patient-perceived quality of the physician and the outcome of the visit.

As wait time has been frequently associated with patient satisfaction, identifying factors that affect wait time is important. Our study demonstrated that differences in wait time length were significant based on appointment time, visit type, whether the visit required an X-ray, and whether the patient was seen by a trainee before the surgeon. Patients being seen for a new patient visit, patients with an appointment time in the later third of the day, patients who required an X-ray before being seen by the surgeon, and patients who were seen by a trainee had significantly longer waiting times. All of these findings seem relatively intuitive. New patients usually are required to fill out paperwork before being seen. Waiting times get longer throughout the day as some patients arrive late or require more time than anticipated, causing the physician to run behind. The time spent obtaining an X-ray

or being seen by a trainee naturally increases the waiting time before seeing the physician. As most of these factors are not easy to change or are inherent to the nature of the patient's visit, care should be taken to inform patients with visits involving these characteristics that they may experience longer than average wait times. In an analysis of emergency department wait times, Soremekun et al described patient satisfaction as a function of expectation and perception (14). The authors explain that, with this model, satisfaction is highest when the patient's perception of the visit exceeds their expectation. Informative and knowledgeable staff can help create positive perceptions, and the information given may in turn shape patient expectations to be more realistic.

Of note, we included visit length recorded in the EMR in our analysis. In the EMR, an office employee logs the time the patient arrives in the office and the time the patient departs. In our main analysis, we determined the wait time to be the time the patient arrives in the office to the time the patient is seen by the physician. The times recorded in the EMR were vastly different from the wait times recorded by our research assistant, with the average visit length in the EMR being 110 minutes and average wait time recorded by the assistant being 34 minutes. The large gap in average times was not accounted for by the time spent with the physician, which was 7 minutes on average. The discrepancy may be secondary to inaccurate reporting. Health systems use the visit length logged in the EMR to evaluate physicians' wait times. As our analysis determined that there is a large discrepancy between the logged visit length and actual wait times, this time should not be used as a surrogate marker for wait times to evaluate physicians.

Our study is not without limitations. A weakness in our study is that it included only patients of one specialized surgeon, limiting the study sample to patients of one region with primarily shoulder and knee complaints. Thus, our findings cannot be generalized to a wider population. Accordingly, we did not evaluate differences in patient satisfaction based on presenting condition as our sample represented a specialized set of complaints. Additionally, we did not account for the effect of physician characteristics on patient satisfaction. As our study included only one surgeon, the study lacked any comparative groups to assess differences between physician-related factors. Most importantly, it must be recognized that, overall, there was a very high satisfaction score among the patients in this study, and there was not a great deal of variability in patient satisfaction scores in relation to wait times. The lack of variability in the outcomes of our study makes the results difficult to generalize to a wider population.

Conclusion

In conclusion, our study found that time spent in the waiting room is important to patient satisfaction in the orthopedic clinic. Wait times were negatively predictive of satisfaction. Patients were overall very satisfied with their visit,

regardless of age, sex, office location, time of appointment, visit type, or time spent with physician. Satisfaction ratings were significantly different based on physician recommendation. New patient visits, appointment times in the later third of the day, appointments requiring an X-ray, and appointments involving a trainee had significantly longer wait times. Care should be taken to inform patients with visits involving these characteristics that they may experience longer than average wait times.

Declaration of Conflicting Interests

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