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The Relationship between Patient's Perceived Waiting Time and Office-Based Practice Satisfaction

Fabian Camacho, MS; Roger Anderson, PhD; Anne Safrit, BS; Alison Snow Jones, PhD; and Peter Hoffmann, MD, MPhil

Abstract

Background: *The amount of waiting time a patient experiences in a primary care or specialty care outpatient setting may have an effect on patient satisfaction and may depend on other visit characteristics. We sought to investigate and quantify the association between waiting time and satisfaction outcomes in clinics belonging to the Wake Forest University Baptist Medical Center and assess how this relationship varies by time spent with the provider.*

Methods: *Cross-sectional survey data was collected at point of care from 18 primary and specialty care clinics at the Center. Overall satisfaction with provider care, the office ratings, and willingness to return were each rated on a 0-to-10-point scale. Multivariate and logistic regressions were performed to examine the relationship between waiting time and outcomes. Covariates included visit time spent with physician, patient care processes, visit convenience, and demographics.*

Results: *2,444 cases were analyzed. Waiting time significantly predicted provider ratings. When time spent with the physician was five minutes or less, provider ratings decreased by 0.3 rating points for each 10-minute increase in waiting time. When time spent with the physician was greater than five minutes, provider ratings decreased by 0.1 rating points for each 10-minute increase in waiting time. The association between waiting time and office satisfaction showed a similar pattern; increased waits also decreased willingness to return (odds decrease by 2% per minute).*

Limitations: *Results may be affected by unreliability of the measures used and from possible selection bias. There is also concern over missing confounders.*

Conclusions: *Our findings confirm that reduced waiting time may lead to increased patient satisfaction and greater willingness to return in primary and specialty care outpatient settings. Furthermore, increased waiting time combined with reduced time spent with the physician coincide with noticeable drops in patient satisfaction.*

Key words: *Patient satisfaction, waiting times, CAHPS*

Introduction

A source of dissatisfaction with healthcare, often noted by patients, is the amount of time they wait during an office or clinic visit. Several studies have documented the relationship between waiting for service and overall satisfaction, with longer waiting times being associated with decreased patient satisfaction. This relationship is not only localized to individual organizations or types of care, but is well documented in general situations involving waiting customers.[1,2]

The strength of the association between waiting time and overall patient satisfaction in healthcare settings varies across the literature. Much of this research has been conducted in emergency departments, where waiting time may be considerable and the level of patient discomfort may be high.[3-7] Results in this area may not apply to traditional primary and specialty care settings, since qualitative differences between situational emergency care and outpatient settings are substantial. Most studies conducted in primary care outpatient settings find a detectable relationship between waiting times and satisfaction,[8-13]

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though results seem to be less uniform than in emergency care.

The literature on perceived quality of primary care indicates that key attributes of healthcare valued by patients are patient-centered, including time spent with the physician, willingness of the physician to listen to the patient, and other measures of patient empathy.[14-16] It is uncertain how waiting times combine with these attributes to affect patient satisfaction, even though understanding such combinations may translate to improvements in patient care. For instance, examining how perceived wait times and time spent with the physician combine to influence satisfaction may help preserve satisfaction levels when time and professional staff resources are tightly constrained, as is typically the case.

In this study, we sought to investigate the association between perceived waiting time and satisfaction in outpatient settings of a large North Carolina hospital after accounting for other factors. At the same time, we included an interaction effect of waiting time and time spent with the provider into our models in order to highlight how certain combinations may be associated with particularly low satisfaction levels. Perceived waiting time was conceptualized as a measure of a patient's time investment in accessing a specific set of healthcare services, which we call "willingness to wait." Patients who perceived themselves as having to wait long periods of time to see a healthcare provider on the day of their visit were hypothesized to have a larger investment in the visit.

Methods

Sample

This study was observational and cross-sectional across primary and specialty care clinic settings. Data were collected using a validated survey methodology,[17] in which a handheld computer was used throughout a clinic business day to collect information from a patient immediately after the patient's clinic visit. Convenience samples were collected from two primary and 16 specialty care clinics in the Wake Forest University Baptist Medical Center from May 2004 to September 2004, for an aggregated total of 2,535 patients distributed throughout 18 clinics. Only patients who were 16 years or older in age were selected into the sample.

Measurements

We assessed three distinct dimensions of patient satisfaction: an overall rating of the provider seen by the patient using the Consumer Assessment of Health Plans Study (CAHPS) global item[18] ranging from 0 (worst provider) to 10 (best provider); a global rating for office staff ranging from 0 (worst) to 10 (best); and 'willingness to return for medical care' rating dichotomized into willing to return versus not willing to return. These items were taken from a more comprehensive set of items that assessed satisfaction with quality of care provided by the physician, which were included in our standard survey. The three global

measures were selected as dependent variables for this based on parsimony and ease of interpretation, consistent with scientific literature on this topic.[19]

Perceived waiting times at the office were captured by patient self-report after the physician-patient encounter, using an item consisting of six categories: 1-5 minutes waiting time in office, 6-15 minutes, 16-30 minutes, 31-45 minutes, and 46 minutes to 1 hour, and more than 1 hour. The shorter time intervals at the start were chosen in order to capture waiting time with more precision, since previous pilot data suggested approximately 70% of the patients waited less than 15 minutes. Waiting times in the exam room were captured in a similar manner.

Dansky[1] showed, out of several definitions of waiting time, that total time spent waiting in the office and exam room was the strongest predictor of satisfaction. For this analysis, we summed both waiting time variables to create a total waiting time composite. We interpolated the categories of waiting time by their midpoints (assuming an average wait of 1 hour and 15 minutes for the relatively few patients who waited more than 1 hour) and summed the midpoints to produce a continuous measure of time.

Potential predictors of patient satisfaction considered in this study are listed in Table 1. These include visit time spent with the healthcare provider, whether visit was to a primary or specialty care clinic, whether the patient was new to the office, self-reported

Table 1. Population Characteristics[a] (N = 2,444)	Descriptive Statistics
Mean waiting time in minutes[b]	20.97 (14.71)
Visit time with provider	
0-4 minutes	14.3%
5-10 minutes	85.7%
Visit was convenient	86.0%
White ethnicity	82.6%
Patient saw preferred provider	34.7%
Age in years[b]	45.9 (16.97)
Highest possible provider empathy score	41.3%
Patient stress reported	45.6%
First visit	22.1%
Visit was for routine check-up	50.5%
Patient had multiple appointments	18.3%
Male gender	34.7%
General practice clinic	7.5%
Office staff rating[b]	8.76 (2.26)
CAHPS provider rating[b]	9.37 (1.23)
Willing to return	83%

a Restricted to patients who had a total waiting time of 75 minutes or less.
b Means are shown with standard deviations in parenthesis.

convenience of visit, reason for visit, whether the patient had multiple appointments during the day, patient stress, gender, age groups, and ethnicity (white versus other minorities combined). Patient perceived stress was measured from a single item asking "Overall, how stressful was your visit today?" Responses were categorized into no patient stress reported versus at least some patient stress reported.

We also used a scale developed and validated for use on a computer platform in order to assess provider empathy.[17] This scale is based on the premise that quality of care can be conceptualized as the patient's perception of provider empathy, concern, friendliness, and compassion.[8] Consistent with previous work, the Cronbach Alpha of this scale in the study sample was 0.93. For analysis purposes, the scale was dichotomized into perfect scores and scores less than perfect.

Statistical Analysis

Multivariate regression and logistic regression models predicting the three satisfaction ratings were estimated using the Generalized Estimating Equations (GEE) method implemented in the SAS System v9 procedure, proc genmod.[20] In order to adjust for clustering, an exchangeable working correlation matrix was specified where the observations were clustered according to clinic. The default robust standard errors in proc genmod were used.

Since 20% of the observations had missing values, we treated missing data by conducting multiple imputations as described in Rubin (1991).[21] The MCMC method in the SAS system's multiple imputation[22] was used to derive imputed values for all the variables listed in Table 1. These same variables were included in the imputation model, as well as the interaction between waiting time and visit time. Three data sets with imputed values were used to conduct the analysis. Wherever possible all estimates and statistics were calculated using combined estimates of three multiply imputed data sets.[23]

Results

Only patients who waited for 75 minutes or less (N = 2,444) were selected for the analysis, as the waiting time variable for patients waiting more than 75 minutes was considered too unreliable, and only 3.6% patients were lost as a result.

From Table 1, mean total waiting time was estimated to be 21 minutes (Standard Deviation = 15), mean age was 46 years (SD = 17), 83% were white and 35% male. Mean office rating was 8.76 (SD = 2.27), mean CAHPS provider rating was 9.37 (SD = 1.23), and 83% of patients were willing to return for care.

Regression results are shown in Table 2. Model predictors explained approximately 23% of the variation for both the CAHPS provider rating and willingness to return, but only 7% of the variation for office rating. No multi-collinearity problems

Table 2.
Regression Results[a]

	CAHPS Provider rating (0 - Worst, 10 - Best) Regression Coefficients	Office Staff Rating (0 - Worst, 10 - Best) Regression Coefficients	Willingness to Return Odds Ratios
Intercept	8.76 (0.14)***	8.54 (0.23)***	
Waiting time in minutes	-0.03 (0.01)***	-0.03 (0.01)**	0.98 (0.98, 0.97)
More than 5 minutes spent with provider	0.13 (0.13)	-0.23 (0.25)	1.59 (2.39, 1.06)
Visit was convenient	0.41 (0.10)***	0.58 (0.13)***	2.12 (2.60, 1.73)
White ethnicity	-0.04 (0.06)	-0.20 (0.14)	0.92 (1.13, 0.75)
Patient saw preferred physician	0.04 (0.05)	-0.01 (0.10)	1.03 (1.23, 0.86)
Highest possible provider empathy score	0.63 (0.04)***	0.64 (0.08)***	3.81 (4.89, 2.97)
Age in years	0.01 (0.00)***	0.01 (0.00)	1.02 (1.02, 1.02)
Patient stress reported	-0.42 (0.05)***	-0.50 (0.12)***	0.46 (0.60, 0.36)
First visit	-0.23 (0.06)**	0.01 (0.10)	0.53 (0.66, 0.42)
Visit was for routine check-up	0.11 (0.04)**	0.06 (0.07)	1.27 (1.52, 1.06)
Patient had multiple appointments	0.01 (0.06)	0.00 (0.11)	1.07 (1.47, 0.78)
Male gender	-0.13 (0.05)*	0.09 (0.10)	1.00 (1.42, 0.71)
Generalist care clinic	-0.07 (0.04)	0.18 (0.15)	1.50 (2.05, 1.11)
Interaction of total time verses visit	0.02 (0.01)**	0.02 (0.01)***	
R-square estimate	0.24	0.07	0.23[b]

a Standard Errors are shown in parenthesis. 95% Confidence Intervals are shown next to odds ratios. Sample was restricted to patients who waited less than 75 minutes (97% of original sample). Coefficients and values are derived from multiple imputations with three replications. * implies p-value of significance test is < 0.05, ** is < 0.01, and *** is < 0.001.
b Adjusted R-square as described in Nagelkerke (1991).

were detected in any of the three regressions, with the lowest tolerance detected at 0.85.

We found that physician satisfaction was lower than expected for patients who waited more than 20 minutes and who had short visit times of 0-5 minutes, as illustrated in Figure 1. The interaction term consisting of waiting time and visit time with physician tested for significance when added to the model (p-value < 0.01).

Satisfaction with the provider decreased by approximately -0.10 rating points per 10 minute increase in waiting when visit times were five minutes or more and -0.30 rating points when visit times were less than five minutes; office satisfaction declined by the same rates; and the odds of willingness to return decreased by 2% per minute.

In addition, satisfaction with the provider was associated with: convenience, quality of care rating, patient age, having a stressful visit, nature of visit, and gender. The findings were consistent by showing that a longer wait, a shorter visit time, a more stressful visit, and lower quality rating were independently associated with lower global satisfaction scores.

Figure 1.
Mean Provider Ratings by Waiting Time and Visit Time

Discussion

This study suggests that increased waiting time is an important source of patient dissatisfaction. For situations in which the time spent with the doctor exceeds five minutes, the regression equations suggest the difference in provider satisfaction may become clinically important after a 50-to-60-minute total wait, at which time the decrease in provider satisfaction exceeds the $1/2$ the standard deviation of the CAHPS provider rating distribution. In addition, the findings suggest longer waits and shorter visits with the physician are, in synergy, associated with increased erosion of overall patient satisfaction (see Figure 1).

We conjecture that a patient's time investment or 'willingness to wait' for healthcare may itself be an indicator of patient satisfaction, analogous to measures of revealed preference for health outcomes, such as the standard-gamble or time trade-off

methods.[24] It certainly conforms to methods employed by economists that use consumers' reactions to changes in price and income to learn about their valuation of purchased goods and services.[25] Economic theory predicts that patients will be willing to incur time and money costs that approximately equal their valuation of the benefit that they expect to receive from this expenditure of time and money.[26,27] In this framework, waiting time is an important component of time price, and willingness to wait should rise with patients' perceptions of increased quality of care. Patients' willingness to wait or their "willingness to pay" for care in time units will also depend on their wage rates and on the severity and chronic nature of their illness. Waiting time can also be conceptualized as eroding the value derived from a treatment.[28] In this sense, it can be viewed as the amount an individual would be willing to pay for a reduction in waiting time.
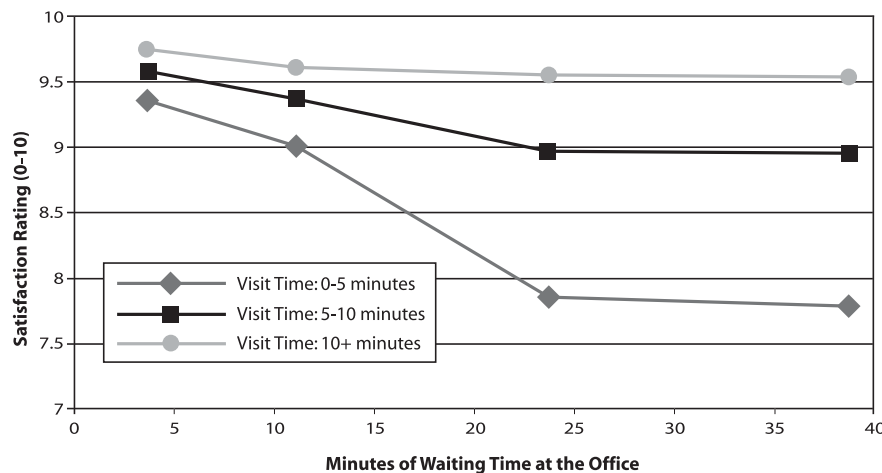
Willingness to wait for medical care could serve as a readily observable indicator for ranking clinics or patient visits by patients' satisfaction levels. However, this does not suggest that perspectives on the timeliness of care are unimportant. It is important to offer brief waiting times so that patients do not feel discomfort or perceive barriers to care, and to communicate respect for the patient. Our results, however, suggest that the threshold for what is satisfying is partially determined by the visit experience and suggest that patients weigh their inconvenience or resource investment against their gain to determine their willingness to return.[29-31] Future work is needed to examine the concept of "willingness to wait" more directly and to explore its value as a measure of patient satisfaction or quality of care.

There are several limitations to this study. The documented reliability of the CAHPS provider rating is fairly low, ranging as low as 0.19 for one subgroup.[32] However, despite this apparent instability, there is a consistent pattern of predictors, which in many cases correspond to the predictors observed for the other two markers of satisfaction, particularly willingness to return. This agrees with other findings in literature that have noticed an association between willingness to return and other measures of patient dissatisfaction.[9,33]

Our survey did not collect additional confounders, which may play a role in changing study results, such as general health status,[30] arriving early,[8] wage rates, travel time to clinic, or additional technical aspects of care, such as provider thoroughness. Of the omitted predictors, general health and wage rate may be strong predictors of the relationship between waiting time and satisfaction. If the reason for visit proxies health status, one might expect people in poor health to be willing to wait longer for care since they would most likely be seeing specialists. It is not

clear that they would rate providers lower on quality. Results here suggest that patients who visit for a routine check-up rate their providers higher.

Despite these limitations, our findings confirm that timeliness is an important component of quality of care in this setting, and that clinically significant drops in satisfaction may be observed after a one hour wait. Although measures of patient empathy and, thusly, of interrelated factors, such as personal attention, communication, and interpersonal style may play a more important role in determining satisfaction, these results suggest that timeliness should not be ignored if patient satisfaction rates are to be maintained, especially if the provider cannot devote much time to his or her patients. **NCMedJ**

REFERENCES

1 Dansky KH, Miles J. Patient satisfaction with ambulatory healthcare services: waiting time and filling time. Hospital &Health Services Administration 1997;42(2):165-177. [PMID: 10167452]

2 Katz K, Larson B, et al. Prescription for the waiting line blues: entertain, enlighten, and engage. Sloan Management Review 1991 Winter;32(2):44-53.

3 Thompson DA, Yarnold PR. Relating patient satisfaction to waiting time perceptions and expectations: the disconfirmation paradigm. Acad Emerg Med. 1995 Dec;2(12):1057-1062. [PMID: 8597916]

4 Mowen JC, Licata JW, et al. Waiting in the emergency room: how to improve patient satisfaction. J Health Care Mark. 1993 Summer;13(2):26-33. [PMID: 10127062]

5 Taylor C, Benger JR. Patient satisfaction in emergency medicine. Emerg Med. J 2004 Sep;21(5):528-532. [PMID: 15333521]

6 Trout A, Magnusson, AR, et al. Patient satisfaction investigations and the emergency department: what does the literature say? Acad Emerg Med. 2000 June;7(6):695-709. [PMID: 10905652]

7 Boudreaux ED, D'Autremont S, et al. Predictors of emergency department patient satisfaction: stability over 17 months. Acad Emerg Med. 2004 Jan;11(1):51-58. [PMID: 14709428]

8 Huang XM. Patient attitude towards waiting in an outpatient clinic and its applications. Health Services Manage Res. 1994 Feb;7(1):2-8. [PMID: 10133292]

9 Zoller JS, Lackland DT, et al. Predicting patient intent to return from patient satisfaction scores. J Ambul Care Manage. 2001 Jan;24(1):44-50. [PMID: 11189796]

10 Bar-Dayan Y, Leiba A, et al. Waiting time is a major predictor of patient satisfaction in a primary military clinic. Mil Med. 2002 Oct;167(10):842-845. [PMID: 12392252]

11 Probst JC, Greenhouse DL, et al. Patient and physician satisfaction with an outpatient care visit. J Fam Pract. 1997 Nov;45(5):418-425. [PMID 9374968]

12 van Uden CJ, Ament AJ, et al. Patient satisfaction with an out-of-hours primary care in the Netherlands. BMC Health Serv Res. 2005 Jan;5(1):6. [PMID: 1561997]

13 Leddy KM, Kaldenberg DO, et al. Timeliness in ambulatory care treatment. An examination of patient satisfaction and wait times in medical practices and outpatient test and treatment Facilities. J Ambul Care Manage. 2003 Apr-Jun;26(2):138-149. [PMID: 12698928]

14 Fiscella K, Meldrum S, et al. Patient trust: is it related to patient-centered behavior of primary care physicians? Med Care. 2004 Nov;42(11):1049-1055. [PMID: 15586831]

15 Thom DH, Hall MA, et al. Measuring patients' trust in physicians when assessing quality of care. Health Aff (Millwood). 2004 Jul-Aug; 23(4):124-132. [PMID: 15318572]

16 Anderson RT, Weisman CS, et al. Evaluation of the quality of care in the clinical care centers of the National Centers of Excellence in Women's Health. Womens Health Issues. 2002 Nov-Dec;12(6):287-290. [PMID: 12457572]

17 McBride JS, Anderson RT, et al. Using a hand-held computer to collect data in an orthopedic outpatient clinic: a randomized trial of two survey methods. Medl Care. 1999 July;37(7):647-651. [PMID: 10424635]

18 Hargraves JL, Hays RD, et al. Psychometric properties of the Consumer Assessment of Health Plans Study (CAHPS) 2.0 adult core survey. Health Serv Res. 2003 Dec;38(6.1):1509-1527. [PMID: 14727785]

19 Weisman CS, Henderson JT, et al. Gender and patient satisfaction in managed care plans: analysis of the 1999 HEDIS/CAHPS 2.0H Adult Survey. Womens Health Issues. 2001 Sep-Oct;11(5):401-415. [PMID: 11566283]

20 Lipsitz SH, Fitzmaurice GM, et al. Performance of generalized estimating equations in practical situations. Biometrics. 1994 Mar;50(1)270-278. [PMID 8086610]

21 Rubin DB, Schenker N. Multiple imputation in health-care databases: an overview and some applications. Stat Med. 1991 Apr;10(4):585-598. [PMID 2057657]

22 Yuan CY. Multiple imputation for missing data: concepts and new developments. SAS Institute 2001. Available at http://support.sas.com/rnd/app/da/new/dami.html.

23 Rubin DB. Multiple Imputations for nonresponse in surveys. J Wiley & Sons, New York 1987.

24 Torrance GW. Measurement of health state utilities for economic appraisal: a review article. J Health Economics. 1986;5(1):1-30. [PMID: 10311607]

25 Samuelson PA. Economics. McGraw-Hill New York: 1980.

26 Becker, GS. A theory of the allocation of time. The Economic Journal. 1965;75(299):493-517.

27 Grossman, M. On the concept of health capital and the demand for health. J Political Economy. 1972;80(2):223-255.

28 Yeung RYT, Leung GM, et al. Waiting time and doctor shopping in a mixed medical economy. Health Econ. 2004 Nov;13(11):1137-1144. [PMID: 15386684]

29 Acton JP. Nonmonetary factors in the demand for medical services: some empirical evidence. J Political Economy. 1975;83(3):595-614.

30 Zapka JG, Palmer RH, et al. Relationships of patient satisfaction with experience of system performance and health status. J Ambul Care Manage. 1995 Jan;18(1):73-83. [PMID: 10139348]

31 Coffey RM. The effect of time price on the demand for medical-care services. J Human Res. 1983;18(3):407-424.

32 Hays RD, Shaul JA, Williams VSL, Lubalin JS, Harris-Kojetin LD, Sweeny SF, Cleary PD. Psychometric properties of the CAHPS 1.0 survey measures. Consumer assessment of health plans study. Med Care. 1999 Mar;37(3 Suppl):MS22-31. [PMID: 10098556]

33 Burroughs TE, Davies AR, Cira JC, Dunagan WC. Understanding patient willingness to recommend and return: a strategy for prioritizing improvement opportunities. Jt Comm J Qual Improv. 1999 Jun;25(6):271-287. [PMID: 10367265]