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What Influences Patients to Recommend an Emergency Department to Others?

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Recent research[1] reported that an Emergency Department (ED) patient's ratings of how well the physician explained one's illness or injury is the best discriminator of extreme satisfaction versus extreme dissatisfaction ratings regarding care received in the ED. The present study uses novometric analysis[1,2] to discriminate 1,012 ED patients who are highly likely, versus 182 who are highly unlikely, to recommend the ED to others. Although ratings of satisfaction and likelihood to recommend are nearly perfectly related, novometry reveals that the best discriminator of ratings of extreme likelihood to recommend versus not to recommend the ED to others is waiting time in the treatment area before being seen by one's physician.

This study examines the relationship between satisfaction and the likelihood of recommending the ED to others, and determines whether the same aspect of care underlies ratings of both satisfaction and likelihood of recommendation.

The study was set in an 800 bed urban university-based level 1 Trauma center with an annual census of 48,000 patients.[1] Patients were mailed a survey assessing their satisfaction with care received in the ED one week after being discharged. The survey elicited ratings of overall satisfaction, the likelihood of recommending the ED to others, and satisfaction with various aspects of administration, nurse, physician, laboratory, and care of family/friends. A total of 2,109 surveys with completed recommendation ratings were returned over a six-month period (17% return rate). Survey items were completed using five-point Likert-type scales: scores of 1 (very poor, N=182) and 2 (poor, N=92) indicate *unlikely to recommend*; scores of 3 (fair, N= 239) indicate *ambivalence*; and scores of 4 (good, N=584) and 5 (very good, N=1,012) reflect *likely to recommend*.

The relationship between overall patient satisfaction and likelihood of recommending the ED to others was assessed by UniODA.[3,4] Results revealed that these ratings were nearly perfectly related: ESS = 98.1. This finding suggests it is possible that the same aspect of care received may be the best discriminator of extreme ratings of satisfaction and of the likelihood of recommending the ED to others.

Novometric analysis unfolded by selecting attributes (survey items) for analysis using structural decomposition analysis (SDA); conducting unrestricted enumerated CTA[5] with selected attributes; applying the minimum denominator search algorithm (MDSA) to

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obtain the descendant family of CTA models within which the globally-optimal (GO) model resides; and computing exact discrete 95% confidence intervals (CIs) for both model and chance classification performance.[1,2]

Analysis included 1,194 patients with extreme recommendation ratings of 1 or 5. SDA identified three attributes for inclusion in CTA: ratings of time in the treatment area waiting to see the doctor; the degree to which the doctor took one's problem seriously; and waiting time in the lobby before going to the treatment area. MDSA identified a descendant family of six unique CTA models (Table 1). Models 1 and 3 used all three ratings; model 2 used lobby waiting time and doctor problem-solving ratings; models 4 and 5 used treatment waiting time and doctor problem-solving ratings; and model 6 used treatment waiting time rating.

Comparison of 95% CIs for model and error performance indicates all six CTA models achieved statistically reliable classification.

Comparison of model 95% CIs reveals that ESS yielded by model 6 was significantly lower (indicating lower accuracy) than the ESS achieved by model 1, but was comparable to the ESS achieved by models 2-5.

Comparison of model 95% CIs also reveals the that efficiency obtained by model 6 was significantly greater (indicating greater parsimony) than was achieved by all other models; efficiency for models 5 and 6 was significantly greater than for models 1-4; and models 1-4 had comparable efficiency. Note that the minimum strata sample sizes for model 1, and to a lesser extent for models 2 and 3, provide substantially lower statistical power[6] than models 3-6, requiring the use of a larger hold-out sample for an attempted replication.

A theoretically ideal CTA model[2] would correctly classify all the data (ESS=100) using a minimum number of strata. If perfect accuracy was obtained by a 2-strata model the efficiency would be 50: the efficiency of model 6 is 73.6% of theoretical ideal. If perfect accuracy was achieved by a 3-strata model the efficiency would be 33.3: efficiency of model 5 is 75.7% of theoretical ideal. In summary, models 5 and 6 achieve comparable accuracy (ESS); model 6 is significantly more parsimonious than model 5; and the models are comparably close to a theoretically ideal model.

Table 1: Summary of MDSA Procedure for Discriminating Patients who are Extremely Likely versus Unlikely to Recommend the ED to Others

Step	Strata	MinD	ESS	Efficiency
1	7	7	87.8	12.5
			81.8-93.2	11.7-13.3
			0.22-5.80	0.03-0.83
2	6	24	85.6	14.3
			79.3-91.1	13.2-15.2
			0.25-6.57	0.04-1.10
3	5	32	81.2	16.2
			75.4-86.4	15.1-17.3
			0.24-6.96	0.05-1.39
4	5	62	80.9	16.2
			75.6-85.6	15.1-17.1
			0.11-7.23	0.02-1.45
5	3	109	75.6	25.2
			71.3-79.5	23.8-26.5
			0.33-7.66	0.11-2.55
6	2	274	73.6	36.8
			66.7-80.0	33.4-40.0
			0.18-7.11	0.09-2.37

Note: There were six steps in this MDSA. Strata is the number of partitions identified by the CTA model. MinD is the smallest number of observations (patients) in any of the strata (i.e., the smallest model endpoint N). ESS is a normed index of classification accuracy on which 0 represents the level of accuracy expected by chance and 100 represents perfect (errorless) classification. By rule-of-thumb: ESS<25 is a relatively weak effect; ESS<50 is a moderate effect; ESS<75 is a relatively strong effect; and ESS>75 is a very strong effect.[3] Efficiency, an index of parsimony, is ESS/number of strata. Under the ESS and Efficiency point estimates, the first row is the exact discrete 95% CI for the model, and the second row is the corresponding 95% CI for chance.

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Figure 1 presents the elemental two-strata UniODA model 6. As seen, in order to increase the number of patients likely to recommend the ED to others, and to reduce the number of patients unlikely to recommend the ED, the model indicates that ED staff should focus on maximizing the number of patients who rate their waiting time in the treatment area as being either "good" or "very good", and minimizing the number of patients who rate their waiting time in the treatment area as being "Fair" or worse.

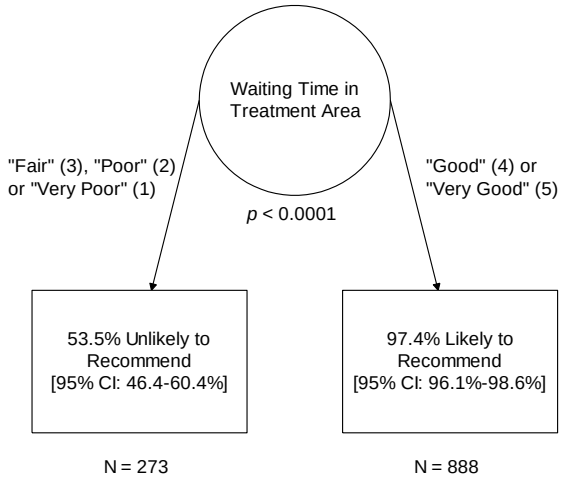

Figure 1: Two-Strata Model for Discriminating Patients Who Are Extremely Likely versus Unlikely to Recommend the ED to Others

Figure 2 presents the three-strata CTA model 5. As seen, in order to increase the number of patients likely to recommend the ED to others, and to reduce the number of patients unlikely to recommend the ED, the model indicates that ED staff should focus on maximizing the number of patients who rate their waiting time in the treatment area as being either "good" or "very good", and who rate the doctor's problem-solving orientation as being "Very Good". Note that the left-most endpoint of models 5 and 6 are identical (four patients omitted ratings of problem-solving orientation).

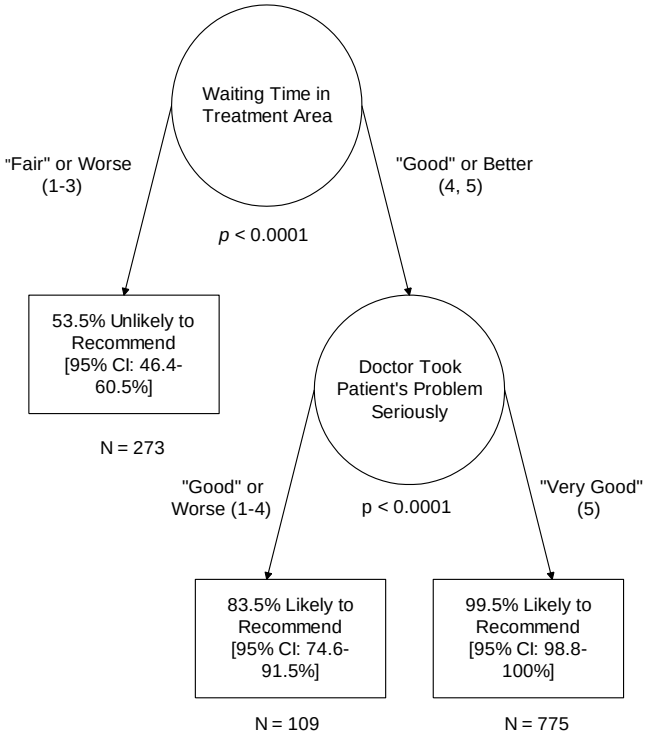

Figure 2: Three-Strata Model for Discriminating Patients Who Are Extremely Likely versus Unlikely to Recommend the ED to Others

Operational selection of the GO model hinges on whether an effective intervention for affecting patient perception of doctor problem-solving orientation is feasible, and the cost- and time-efficiency of the intervention. However, if the most parsimonious and efficient intervention is desired, then the two-strata model should be selected as the GO model for affecting the likelihood of patient ED recommendations.

References

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