

Sentiment Analysis of Pain Physician Reviews on Healthgrades, A Physician Review Website

Christopher P. Cheng, AB¹, Tony Owusu, BS¹, Andrew J. Warburton, MD², Paul R. Shekane, MD³, Alopi Patel, MD³

¹Department of Medical Education, Icahn School of Medicine at Mount Sinai, New York, NY 10029 USA

²Department of Anesthesiology, Perioperative, and Pain Medicine, Icahn School of Medicine at Mount Sinai, New York, NY 10029 USA

³Department of Anesthesiology, Perioperative and Pain Medicine, Mount Sinai West and Mount Sinai Morningside Hospitals, New York, NY 10019 USA

INTRODUCTION

- There are currently no published studies using patient reviews of pain physicians to quantitatively assess patient preferences for pain physician attributes.
- The aim of the present study was to use natural language processing to quantitatively analyze patient reviews of pain physicians by determining the effect of physician demographics and word frequency on positive review outcomes.

METHODS

- Using a peer-reviewed algorithm, online Healthgrades reviews of pain physicians practicing in the United States were scored according to their positive sentiment from -1 to 1.
- These sentiment scores and star ratings were used to compare physicians by age, gender and region of practice. Frequency analysis of words and bigrams was performed for all reviews.

TABLES & FIGURES

Table 1: Healthgrades sample vs national average demonstrate Healthgrades as an accurate surrogate for national averages.

Demographics	Healthgrades Sample Percentages	Current National Percentages
Gender		
Male	1071 (84%)	4745 (81%)
Female	204 (16%)	1113 (19%)
Age*		
< 55	759 (63.8%)	4074 (69.4%)
≥ 55	430 (36.2%)	1797 (30.6%)
Region		
West	178 (14.0%)	1154 (19.2%)
Midwest	268 (21.0%)	1179 (19.6%)
Southwest	231 (18.1%)	775 (12.9%)
Southeast	385 (30.2%)	1626 (27.0%)
Northeast	213 (16.7%)	1278 (21.3%)

Table 2: Comparison by gender and age of star rating and sentiment score

Metric	Male (mean ± SD)	Female (mean ± SD)	P value	Age <55 (mean ± SD)	Age ≥55 (mean ± SD)	P value
Star rating (/5)	4.01 ± 1.67	3.80 ± 1.79	<0.001	3.93 ± 0.923	3.74 ± 1.01	<0.001
VADER score [-1, +1]	0.322 ± 0.658	0.262 ± 0.676	<0.001	0.295 ± 0.320	0.240 ± 0.341	0.006

RESULTS

- 15101 reviews among 1275 pain physicians showed male physicians received higher star ratings and review sentiment scores than did female physicians.
- Pain physicians younger than 55 years received higher star ratings and sentiment scores than those of 55 years and older.
- Frequency analysis revealed that words most commonly used in the more positive patient reviews included “care”, “professional”, “patient”, “help”, and “kind”; the words most commonly used in less positive reviews included “pain”, “back”, “office”, “time”, and “years”.

CONCLUSIONS

- Male and/or younger pain physicians receive more positive reviews.
- Patients highly rate pain physicians who are perceived as personable.
- Patients lowly rate physicians who are perceived as providing ineffective treatment of their pain as well as when they experience barriers to their access to care.