

Online Reviews Provide Insight into Consumer Satisfaction

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Consumer satisfaction is one of the key concepts in health care and refers to how happy our consumers are with the health care services they receive. Reported satisfaction is also an indicator of healthcare quality, specifically as perceived by the end users. The growth and increasing popularity of online review platforms, including Google or Yelp, has meant that consumers can now easily share their experiences with wider audiences, allowing them to assess potential services and reported outcomes.



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A recent systematic review demonstrated consistent positive associations between online patient reviews and health organizations and individual provider outcomes.¹ Since online review platforms contain unsolicited reviews provided voluntarily, they also offer unique insights into the consumer journey and factors associated with consumer satisfaction. In particular, the consumer-oriented perspective offered by online reviews into the personal experiences and perceived outcomes in health services have significant potential to inform more person-centered care.^{2,3}

Online reviews typically include some sort of rating (for example, rating on a five-point scale with five-star rating indicating highest satisfaction) and open text descriptions to describe their experiences and support their selected rating. In the digital age, it has become an important part of any business, including the health care industry, to pay attention to these reviews. Despite the use of reviews by individual businesses, there has been very limited efforts to analyze and understand reviews about a health care specialty or sector using large scale analysis of reviews. This is partly due to the difficulty in extracting and summarizing meaningful concepts from large datasets of textual feedback. Fortunately, there has been tremendous progress in software technologies specialized in analyzing large text data referred to as natural language processing (NLP).

The field of NLP is a rapidly growing area of data science and uses digital technologies, as a branch of artificial intelligence, to understand text and spoken words in a way similar to human beings. ⁴ It is widely implemented into everyday technologies such as Chatbots, autocorrect and autocomplete text functions, language translators, and social media monitoring features. NLP also has significant potential to examine large numbers of consumers' reviews quickly to extract information in a meaningful way. ^{2,5,6} In a recent study, we extracted 9,622 consumer reviews about hearing health care services from 40 cities across the U.S. from Google.com and analyzed these using NLP techniques. ^{6,7} This included identifying the key topics and language dimensions from the text reviews as well as examining their association with quantitative satisfaction ratings. What follows is a summary of key findings as well as implications for clinical hearing health practice.

HEARING HEALTH CONSUMER SATISFACTION

The consumer reviews on Google.com for hearing healthcare providers were rated on a five-point Likert scale ranging from "very poor" to "very good." The majority of reviews (95%) were "very good" and "good," suggesting that hearing health care consumers reporting experiences online are generally satisfied with their services.

MAIN THEMES

The text reviews associated with the ratings were analyzed using the "topic modeling" approach. Topic modeling is a broad term within the NLP in which automated analysis of text data is performed to identify meaningful themes within the data. This approach provides information comparable to qualitative analysis, such as content analysis or thematic analysis, although it has the advantage of processing a large amount of text within a few minutes. The topic modeling of consumer reviews on hearing health care services resulted in seven clusters (themes) within two domains (Table 1). Six of the clusters generally included positive reports except for the "administration processes" cluster. Negative reported experiences in the administration processes cluster had more influence on the overall rating, suggesting that consumers were more inclined to provide poorer overall experience ratings when they had issues with the administration process.

LINGUISTIC ANALYSIS

The text reviews were also subjected to automated linguistic inquiry word count (LIWC). This method examines each of the words and assigns a psychologically meaningful dimension to them. For example, the word "happy" may indicate positive emotions, whereas the word "cried" may indicate sadness or negative emotions. While the software provides output in over 90 psychological language dimensions, in this study, 10 key dimensions were considered. ⁷ The consumer reviews on hearing health care services had higher social processes, positive emotions, hearing, health, money, and work and lower negative emotions and time awareness when compared to typical bloggers. ⁷

Table 1. Identified domains, clusters and representation (%) across text analyses of online hearing healthcare reviews (Manchaiah et al. 2021a)

Domains	Clusters (% representation)	Descriptions
Clinical processes	Administration processes (14.1%)	Relating to booking, paying, attending appointments. Insurance commonly used along with negative experience or emotion words (e.g., rude, wait, pain, bad).
	Clinician communications (8.4%)	Communication and/or qualities of hearing healthcare clinician interactions including providing information and explanations, asking and answering questions, demonstrating effective listening skills. Mostly positive and contributing to a therapeutic relationship.
	Staff professionalism (17.8%)	Professionalism of front office staff, and were mostly positive. Typically described as knowledgeable, friendly, and helpful.
Staff & service interactions	Customer service (11.5%)	Customer service experience mostly positive. Included speed/efficiency, affordability and overall positive experiences.
	Perceived benefits (7.9%)	Personal benefits from hearing devices included improved hearing and communication in a wide variety of situations (quiet and in noise), conversing in small and large groups, and enjoying nature sounds and music.
	Provide satisfaction (19.2%)	Satisfaction with services. Majority of entries report high recommendation of their service provider with supporting reasons.
	Device acquisition (21.5%)	Acquisition of hearing aids, including process of selecting appropriate device and features, learning how to use and manage it, benefits and/or challenges experienced.

Moreover, examining the association between overall satisfaction ratings and the language dimensions point to two broad findings:

1. Better ratings of experiences were related to higher consumer engagement in terms of the dimensions of social processes, positive emotions, hearing, and work.
2. Poorer ratings of experiences were related to higher consumer engagement in terms of dimensions of negative emotions, time awareness, and money.

To better understand, interpret and apply LIWC analyses in the context of hearing health care, we are developing a customized dictionary based on experiences of patients with hearing loss. This project is part of a larger research initiative of the newly established Virtual Hearing Lab (www.virtualhearinglab.org).

PRACTICE IMPLICATIONS

Consumer satisfaction has become integral to health care delivery, usage, and reimbursement. For example, many health care insurance providers reimburse for service only when patient (or consumer) satisfaction is reaching a desired level. In addition, many consumers tend to use reports of other consumers especially by means of online reviews while making decisions about their health care products and/or services. For this reason, examining consumer reviews to inform improved consumer satisfaction is very important. This is particularly important for audiology with the move toward direct-to-consumer hearing care and the new over-the-counter hearing aid regulation. These analyses can inform more person-centered care and strengthen the value proposition of audiologists as hearing health care professionals.

Online reviews provide a quick way to understand the satisfaction of health care consumers and contributing factors that allow providers to address potential issues to improve quality of care and health care outcomes. For example, an examination of Google reviews suggests that

improving the administration process of hearing health care services and front office engagements is an important strategy to improve overall consumer satisfaction ratings.

While online reviews offer much potential, it is still a relatively new area of investigation that requires further exploration of appropriate techniques that are clinically appropriate and include quality metrics.⁸

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