

# The Utility of Google Rating as a Tool for Evaluating Nursing Homes Performance

**Dr. Yaseen Hayajneh<sup>a</sup>, Dr. Ibtihal Almahzoomy<sup>b</sup>, Adeb Hayajneh<sup>c</sup>,**  
<sup>a</sup>Associate Professor, Management Department, Ancell School of Business, Western Connecticut State University, <sup>b</sup>Assistant Professor, School of Nursing, Nathan Weiss Graduate College, Kean University, <sup>c</sup>Molecular Biology Student, New Jersey Center for Science, Technology and Mathematics, Kean University

The study aims to validate the utility of Google rating in evaluating nursing homes' performance. The researchers used a correlational design to determine if the average Google rating was associated with CMS's NHCompare 5-star ratings, the researchers compared Google consumer-reported ratings of nursing homes to the Centers of Medicare and Medicaid Services (CMS) Nursing Home Compare (NHCompare) 5-star ratings. Three hundred and forty-five out of 363 nursing homes in New Jersey were included in the study. The average Google rating was 3.74, and the average NHCompare overall star rating was 3.64. Analysis revealed a statistically significant and weak positive correlation between the average Google rating and the NHCompare overall star rating ( $r=0.12$ ,  $p < 0.05$ ), health inspection rating ( $r=0.11$ ,  $p < 0.05$ ), and quality of resident care rating ( $r=0.15$ ,  $p < 0.01$ ). Although Google rating was correlated with NHCompare 5-star ratings, the correlation coefficients were too weak to be meaningful and insufficient to validate the utility of using Google rating as a standalone measure of nursing home quality. Using Google rating as a standalone measure for evaluating nursing homes' performance should be done with caution.

**Key words:** *Google Rating, Nursing Homes Performance*

## INTRODUCTION AND BACKGROUND

Nursing homes are an important segment of the US long-term care system. These facilities provide services and support for some of society's most vulnerable individuals, the elderly and disabled. In 2016, 15,600 nursing homes in the US provided 1,660,400 certified beds (National Center for Health Statistics, 2021). It is estimated that approximately 70% of Americans who



survive to age 65 will need long-term services and support and that 48% of them will receive some paid care over the remainder of their lives and that 15% of them will spend at least two years in a nursing home (Johnson, 2019).

The Nursing Home Compare (NHCompare) 5-Star Quality Rating System is a national public reporting system intended to inform patients and families about the performance of nursing homes (Brauner et al., 2018). The Centers of Medicare and Medicaid Services (CMS) established the NHCompare website in 1998 to enable patients and families to find and compare nursing homes in their communities (CMS, 2015). NHCompare website contains information about every Medicare and Medicaid certified nursing home in the US (Medicare.gov, 2020). CMS intends for the rating system to help consumers make meaningful comparisons between nursing homes. CMS also aims to help nursing homes to identify areas for improvement (CMS, 2020).

## **INTERNET AND SOCIAL MEDIA**

The use of the Internet and social media has had profound effects on society. Before social media, businesses relied on traditional reach methods to brand and market their services and goods. Word of mouth was a significant source of information for the public to evaluate nursing homes' quality and performance (Shugarman & Brown, 2015).

Now more than ever, consumers can reflect on their experiences with almost any business by leaving an online rating and review. As a result, the Internet has increasingly become a key source of information and an outlet to rate and evaluate businesses of all kinds. Consequently, the growing use of the Internet and social media has enabled patients and families to provide feedback and rate nursing homes' performance and quality of services. In addition, consumers are increasingly seeking information about these facilities' quality and performance online (Gaudet Hefele et al., 2017).

## **GOOGLE REVIEWS AND RATINGS**

Google reviews website, among other online platforms, allow patients and families to provide real-time feedback on their experiences. These ratings reflect the subjective features of consumer experiences. These online platforms are transforming how consumers evaluate businesses in almost every industry, including healthcare. Online reviews represent the online version of the traditional word-of-mouth marketing strategy, except with a larger informed consumer pool. Google reviews and ratings reported by consumers on the Google platform constitute an essential source of information for patients and families seeking to identify nursing homes known for their quality services. Google reviews and ratings are a timely, open, and cost-effective source of such information. Besides, Google dominates the online review market with a market share of 57.5% of all online reviews (Rexly, 2020).



Online reviews are primarily unstructured and are not subject to the same quality control measures inherent in more stringent survey instruments or inspections (Mowery et al., 2016). Thus, the question arises: To what extent can users trust these reviews as a valid representation of the service quality provided in a nursing home; however, evidence on nursing home care is limited. Answering this question presents an opportunity to understand better how Google reviews and ratings compare to nursing homes' existing quality measures. Therefore, it is crucial to validate the utility of online Google rating in assessing nursing homes' performance and quality of care.

## **PURPOSE OF THE STUDY**

The purpose of this study is to validate the utility of using Google rating in assessing nursing homes' performance and quality of care. The CMS NHCompare 5-Star Quality Rating of nursing homes will be the benchmark that the study will use. In addition, the study aims to determine the association between Google rating and NHCompare 5-star ratings.

## **METHODS**

### **DESIGN, DATA SOURCES, AND DATA COLLECTION**

A cross-sectional correlational design was used to examine data from two sources and to examine if there is an association between Google rating and NHCompare 5-star ratings of New Jersey nursing homes. Data were collected from the NHCompare website and the Google reviews website in December 2020 (Medicare.gov, 2020; Google Maps, 2020). The data collected from the NHCompare website included the number of beds, overall star rating, health inspections rating, staffing rating, and quality of resident care rating. The data collected from the Google reviews website were the cumulative number of Google reviews and the cumulative Google average rating.

Google reviews website allows users to rate their experiences with all types of businesses, including healthcare providers using 1-star (worst experience) to 5-stars (best experience) and to share their narrative review of their experiences (Google Maps, 2020; Mowery et al., 2016).

The NHCompare data are updated by the CMS and provide basic nursing home characteristics such as facility name and address, number of certified beds, the overall star rating, and the domains' star ratings. The number of certified beds in the nursing home is that the federal government has approved to participate in Medicare or Medicaid.

Three domains determine each nursing facility's NHCompare overall star rating: state inspections, staffing ratios, and clinical quality. Each facility is assigned a star rating for each of these three domains. The number, scope, and severity of deficiencies found during state visits and the number of repeat visits needed to confirm the correction of these deficiencies

determine the health inspection domain rating. The health inspection star rating is relative to other facilities in the state (Brauner et al., 2018). The CMS views the health inspection rating as the most critical evaluation component (StarPRO, 2020). The second domain is the staffing domain. Based on specific national benchmarks, case-mix-adjusted nurse hours per resident determine the staffing domain rating. The quality of resident care domain rating is determined based on meeting national thresholds across various outcome measures, including patient safety measures. Each facility's overall star rating is calculated based on the three domains, using the health inspection star rating as a base and adjusting the rating depending on the staffing and clinical quality star ratings (Brauner et al., 2018).

## **SAMPLE**

A list of all New Jersey nursing homes listed on the CMS website was extracted for the study (N=363) (Medicare.gov, 2020). Data were collected for all the nursing homes on the list. Three hundred and forty-five nursing homes were included in the final analysis. A total of 18 nursing homes were excluded from the analysis for having one of the following conditions: being a hospital-based unit (n=10), no reported Google rating (n=7), or no reported NHCompare 5-star ratings (n=1).

The following data for each nursing home was collected from the NHCompare website: the number of beds, overall star rating, and the three domain-specific ratings (i.e., health inspections rating, staffing rating, and quality of resident care rating). In addition, Google's average rating and the number of Google reviews for each nursing home were collected from the Google reviews website (Google Maps, 2020).

## **DATA ANALYSIS**

Data analysis was conducted using the SPSS version 26 and Microsoft Excel spreadsheet software (*SPSS Statistics*, 2021; Microsoft, 2019). The analysis determined the strength of the association between the facility-level average Google rating and facility-level star ratings for New Jersey nursing homes as published on the NHCompare website. The pairwise association between facility-level Google rating and the overall star rating, health inspections rating, staffing rating, and quality of resident care rating were determined using Pearson's correlation coefficient. Statistical significance was defined as  $P < 0.05$  for the corresponding correlation coefficients.

The dataset included all the values for all the variables for all nursing homes (N=345), except for the staffing rating variable, where seventeen nursing homes lacked the values for this variable. Therefore, pairwise deletion of missing data was the appropriate approach to follow to minimize the impact of these missing values. When conducting correlational research, pairwise deletion of missing data is the most appropriate (Kang, 2013).

## RESULTS

Among the sample of 345 New Jersey nursing homes included in the analysis, the average number of Google reviews was 33.7 reviews with a median of 25 and a mode of 21 reviews, as illustrated in Table 1. As illustrated in table 1, the average Google rating for New Jersey nursing homes was 3.74, with a median of 3.9 and a mode of 4. Google rating values ranged between a score of 1 and 5. The analysis also revealed that the average number of certified beds in New Jersey nursing homes was 147.2 beds, with a median of 128 and a mode of 120 beds.

As illustrated in Tables 1 and 2, the data analysis further revealed that the overall star rating for New Jersey nursing homes was 3.64 on average, with 59.2 percent of nursing homes achieving 4-stars or 5-stars in the overall star rating. For domain 1 Health Inspection Rating, the star rating for New Jersey nursing homes averaged 2.86 stars, with 35.6 percent of the nursing homes achieving the 4-stars or 5-stars rating. For domain 2 Staffing Rating, New Jersey nursing homes averaged 3.38 stars, with 46 percent of the nursing homes achieving the 4-stars or 5-stars rating. Finally, for Domain 3 Quality of Resident Care, New Jersey nursing homes averaged 4.47 stars, with 86.1 percent of the nursing homes achieving 4-stars or 5-stars ratings.

As detailed in table 3, the analysis revealed weak correlation coefficients between the Google rating and the NHCompare overall rating, the health inspection rating, and the quality of resident care rating, albeit positive and statistically significant. This finding highlights a weak association between Google rating and these NHCompare ratings. The only NHCompare domain that was found not to have a statistically significant correlation with Google rating was domain two staffing rating.

Interestingly enough to mention, as shown in Table 3, the analysis revealed that the number of certified beds of nursing homes was negatively correlated, with statistical significance, with Google rating, and with all NHCompare ratings except for the quality of resident care domain rating.

## DISCUSSION

Our analysis identified weak correlations between Google rating and the NHCompare overall star rating ( $r=0.12$ ,  $p < 0.05$ ), health inspection rating ( $r=0.11$ ,  $p < 0.05$ ), and quality of resident care rating ( $r=0.15$ ,  $p < 0.01$ ). However, the analysis identified a very weak correlation between Google rating and the staffing rating ( $r=-0.025$ ) with no statistical significance.

The correlation coefficients between Google rating and the NHCompare 5-star ratings in this sample of New Jersey nursing homes were too weak to be meaningful and insufficient to validate the utility of using Google rating as a standalone measure of nursing home quality. Therefore, Google rating as a standalone measure for assessing the quality of nursing homes should be exercised with caution. Ensuring the truthfulness of the more subjective online



reviews and ratings continues to be a significant challenge; ratings and reviews left by incentivized, pushed, and disgruntled reviewers may jeopardize the trust in online reviews and ratings. Furthermore, while the NHCompare methodology relies mainly on administrative objective data to calculate the nursing home ratings, Google ratings are based on residents' and families' subjective evaluation of their experiences and observations. Therefore, it does not come as a surprise that the Google rating may not be associated with NHCompare ratings. Consequently, our findings indicate that although Google ratings are not associated with NHCompare ratings and may not be used as a standalone measure of nursing home quality, they still can provide a valuable perspective into the assessment of nursing home performance.

Our findings conflict with two earlier studies' findings ((Li et al., 2019; Bardach et al., 2012). Maryland nursing homes' social media ratings were associated with NHCompare 5-star ratings (Li et al., 2019). However, the Maryland nursing homes study calculated an average score of four different social media ratings (Facebook, Yelp, Google Consumer Reviews, and Caring.com) and determined if the average social media rating was associated with NHCompare ratings (Li et al., 2019). Other studies conducted within hospital settings found an association between various aspects of quality of hospital care and online consumer ratings using other comparable online platforms (Bjertnaes et al., 2019; Campbell & Li, 2017; Bardach et al., 2012). These studies examined the correlation between Yelp (Bardach et al., 2012), Facebook (Bjertnaes et al., 2019; Campbell & Li, 2017), and the quality of hospital care using traditional hospital performance measures (Bardach et al., 2012), nation-wide hospital quality assessment (Bjertnaes et al., 2019), and hospital quality and patient satisfaction measures (Campbell & Li, 2017). Our study specifically examined the association of Google rating as the most common online review site and the first-to-go platform for consumers.

In alignment with the findings of our study, earlier studies examining the association of Facebook reviews and Yelp online platform and quality measures of nursing homes found consumers' online ratings on Facebook and Yelp, a website similar to Google, were different from the NHCompare 5-star ratings (Gaudet Hefele et al., 2017; Johari et al., 2017). In addition, in their study of Maryland and Minnesota nursing homes, Gaudet Hefele et al. (2017) found no significant correlation between consumer ratings on nursing homes' Facebook pages and the NHCompare 5-star ratings (Gaudet Hefele et al., 2017). The sample, however, included nursing homes that allowed reviews on their Facebook page, which could subject the reviews to selective bias when nursing homes with potential negative reviews may disable the reviews feature of the Facebook page.

A secondary but rather important finding indicates that the size of nursing homes is a factor in determining the quality of nursing homes services. Our study found that the size of the nursing home, measured by the number of certified beds, was negatively associated with the average Google rating and the NHCompare 5-star ratings. This finding is consistent with an earlier study that revealed family reported experiences with care were lower for Maryland nursing homes affiliated with large- and medium-for-profit chains (You et al., 2016). Although this



finding may indicate that larger nursing homes may have lower consumer-reported ratings, further research to establish this is needed.

One limitation that should be taken into consideration when evaluating the findings of this study is that the study did not include the qualitative narratives of Google reviews. Including an analysis of the qualitative narratives will provide further insight into the experiences. Another limitation of the study is the sampling bias inherent in online review platforms where reviewers self-select to provide their input which renders it difficult to ascertain the truthfulness of the individual rating.

## CONCLUSION

Even though the Google rating of New Jersey nursing homes was correlated with the NHCompare 5-star ratings, the correlation coefficients were too weak to be meaningful. The correlations were insufficient to validate the utility of using Google rating as a standalone measure of nursing home quality. Therefore, Google rating as a standalone measure for assessing the quality of nursing homes should be exercised with caution. Online consumer-review platforms such as Google ratings may contribute to a better understanding of nursing homes' performance. The information obtained from Google ratings can complement the more traditional patient satisfaction surveys and state-sponsored methods of evaluating nursing homes.

Utilizing Google rating and other online platforms in healthcare quality assessments is still a relatively new and underdeveloped research area (Bjertnaes et al., 2019). Therefore, further research is needed to establish the value of consumer-reported online review platforms in assessing the performance of nursing homes and other types of health care facilities. Furthermore, future research should consider the likelihood of respondents' bias in providing online reviews, which may lead to an inaccurate reflection of consumers' experiences (Li et al., 2019). Finally, incorporating quantitative and qualitative methods may provide greater insight into the value of using online platforms to assess nursing homes' performance.



## REFERENCES

- Bardach, N. S., Asteria-Peñaloza, R., Boscardin, W. J., & Dudley, R. A. (2012). The relationship between commercial website ratings and traditional hospital performance measures in the USA. *BMJ Quality & Safety*, 22(3), 194–202. <https://doi.org/10.1136/bmjqs-2012-001360>
- Bjertnaes, O., Iversen, H. H., Skyrud, K. D., & Danielsen, K. (2019). The value of Facebook in nation-wide hospital quality assessment: a national mixed-methods study in Norway. *BMJ Quality & Safety*, 29(3), 217–224. <https://doi.org/10.1136/bmjqs-2019-009456>
- Brauner, D., Werner, R. M., Shippee, T. P., Cursio, J., Sharma, H., & Konetzka, R. T. (2018). Does Nursing Home Compare Reflect Patient Safety In Nursing Homes? *Health Affairs*, 37(11), 1770–1778. <https://doi.org/10.1377/hlthaff.2018.0721>
- Campbell, L., & Li, Y. (2017). Are Facebook user ratings associated with hospital cost, quality and patient satisfaction? A cross-sectional analysis of hospitals in New York State. *BMJ Quality & Safety*, 27(2), 119–129. <https://doi.org/10.1136/bmjqs-2016-006291>
- CMS. (2015, February 12). *Nursing Home Compare 3.0: Revisions to the Nursing Home Compare 5-Star Quality Rating System* | CMS. <https://www.cms.gov/newsroom/fact-sheets/nursing-home-compare-30-revisions-nursing-home-compare-5-star-quality-rating-system>
- CMS. (2020). *Design for Nursing Home Compare Five-Star Quality Rating System: Technical Users' Guide*. <https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/CertificationandCompliance/Downloads/usersguide.pdf>
- Gaudet Hefele, J., Li, Y., Campbell, L., Barooah, A., & Wang, J. (2017). Nursing home Facebook reviews: who has them, and how do they relate to other measures of quality and experience? *BMJ Quality & Safety*, 27(2), 130–139. <https://doi.org/10.1136/bmjqs-2017-006492>
- Google Maps. (2020). *Google Maps*. [Google Maps](https://www.google.com/maps/). <https://www.google.com/maps/>
- Johari, K., Kellogg, C., Vazquez, K., Irvine, K., Rahman, A., & Enguidanos, S. (2017). Ratings game: an analysis of Nursing Home Compare and Yelp ratings. *BMJ Quality & Safety*, 27(8), 619–624. <https://doi.org/10.1136/bmjqs-2017-007301>
- Johnson, R. (2019). What is the lifetime risk of needing and receiving long-term services and supports? Office of The Assistant Secretary for Planning and Evaluation. <https://aspe.hhs.gov/system/files/pdf/261036/LifetimeRisk.pdf>
- Kang, H. (2013). The prevention and handling of the missing data. *Korean Journal of Anesthesiology*, 64(5), 402. <https://doi.org/10.4097/kjae.2013.64.5.402>
- Li, Y., Cai, X., & Wang, M. (2019). Social media ratings of nursing homes associated with experience of care and “Nursing Home Compare” quality measures. *BMC Health Services Research*, 19(1). <https://doi.org/10.1186/s12913-019-4100-7>
- Medicare.gov. (2020). Medicare.gov. <https://www.medicare.gov/care-compare/>
- Microsoft. (2019). *Use the Analysis ToolPak to perform complex data analysis*. Microsoft.com. <https://support.microsoft.com/en-us/office/use-the-analysis-toolpak-to-perform-complex-data-analysis-6c67ccf0-f4a9-487c-8dec-bdb5a2cefab6>



- Mowery, J., Hohman, E. L., Jian, J., Andrei, A., & Ward, M. E. (2016). Assessing Quality of Care and Elder Abuse in Nursing Homes via Google Reviews. *Online Journal of Public Health Informatics*, 8(3). <https://doi.org/10.5210/ojphi.v8i3.6906>
- National Center for Health Statistics. (2021). *FastStats - Nursing Home Care*. Centers for Disease Control and Prevention. <https://www.cdc.gov/nchs/fastats/nursing-home-care.htm>
- Rexly, P. (2020, October 6). *How to Get Google Reviews | ReviewTrackers*. ReviewTrackers. <https://www.reviewtrackers.com/blog/how-to-get-google-reviews/>
- Shugarman, L., & Brown, J. (2015, June 13). *Nursing Home Selection: How Do Consumers Choose? Volume I: Findings from Focus Groups of Consumers and Information Intermediaries*. ASPE. <https://aspe.hhs.gov/basic-report/nursing-home-selection-how-do-consumers-choose-volume-i-findings-focus-groups-consumers-and-information-intermediaries>
- SPSS Statistics - Overview*. (2021). Ibm.com. <https://www.ibm.com/products/spss-statistics>
- StarPRO. (2020, May 20). *A Guide to the CMS Nursing Home Five-Star Rating Program - StarPRO*. StarPRO. <https://getstarpro.com/what-are-the-star-ratings/>
- Weaver, C., Anna Wilde Mathews, & Kamp, J. (2020, June 5). *U.S. Nursing Home Population Shrank Roughly 10% This Year*. WSJ; The Wall Street Journal. <https://www.wsj.com/articles/u-s-nursing-home-population-shrank-roughly-10-this-year-11591315220>
- You, K., Li, Y., Intrator, O., Stevenson, D., Hirth, R., Grabowski, D., & Banaszak-Holl, J. (2016). Do Nursing Home Chain Size and Proprietary Status Affect Experiences With Care? *Medical Care*, 54(3), 229–234. <https://doi.org/10.1097/mlr.0000000000000479>

Table 1. Descriptive Statistics of Study Variables.

	N	Mean	St Dev	Median	Mode	Min-Max
Number of Certified Beds	345	147.2	72.6	128	120	17 - 547
Number of Google Reviews	345	33.7	29.6	25	21	1 - 258
Google Rating	345	3.74	0.67	3.9	4	1.1 - 5
NHCompare Overall Star Rating	345	3.64	1.35	4	5	1 - 5
NHCompare Domain 1: Health Inspections Rating	345	2.86	1.27	3	4	1 - 5
NHCompare Domain 2: Staffing Rating	328	3.38	1.11	3	3	1 - 5
NHCompare Domain 3: Quality of Resident Care Rating	345	4.47	0.84	5	5	1 - 5

Table 2. Frequency Distribution of Overall Star rating and Domain-Specific Star Ratings for New Jersey Nursing Homes

		1-star	2-stars	3-stars	4-stars	5-stars
NHCompare Overall Star Rating (n=345)	n (%)	28 (8.1%)	58 (16.8%)	55 (15.9%)	72 (20.9%)	132 (38.3%)
NHCompare Domain 1: Health Inspections Rating (n=345)	n (%)	64 (18.6%)	80 (23.2%)	78 (22.6%)	88 (25.5%)	35 (10.1%)
NHCompare Domain 2: Staffing Rating (n=328)	n (%)	12 (3.7%)	65 (19.8%)	100 (30.5%)	88 (26.8%)	63 (19.2%)
NHCompare Domain 3: Quality of Resident Care Rating (n=345)	n (%)	1 (0.3%)	13 (3.8%)	34 (9.9%)	72 (20.9%)	225 (65.2%)

Table 3. Pearson Correlations between Google Rating, NHCompare Overall Star Rating, Health Inspection Rating, Staffing Rating, Quality of Resident Care rating, and Number of Certified Beds.

Variable	1	2	3	4	5	6
1. Google Rating	.					
2. Overall Star Rating	.119*	.				
3. Health Inspection Rating	.112*	.853**	.			
4. Staffing Rating	-.025	.453**	.222**	.		
5. Quality of Resident Care	.153**	.500**	.235**	.193**	.	
6. Number of Beds	-.233**	-.259**	-.323**	-.162**	-.079	.

\*\* Correlation is significant at the 0.01 level (2-tailed)

\* Correlation is significant at the 0.05 level (2-tailed)