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Google Trends as a Resource for Informing Plastic Surgery Marketing Decisions

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Abstract

Background Celebrities have long influenced the medical decisions of the general population. By analyzing Google search data using Google Trends, we measured the impact of highly publicized plastic surgery-related events on the interest level of the general population in specific search terms. Additionally, we investigated seasonal and geographic trends around interest in rhinoplasties, which is information that physicians and small surgical centers can use to optimize marketing decisions.

Methods Google Trends was used to access search data histories for three separate areas of interest: Kylie Jenner and lip fillers, Joan Rivers and plastic surgery, and rhinoplasty, which were then analyzed using two-tailed, two-sample equal variance t-tests.

Results The average interest level in fillers increased by 30.31 points after Kylie Jenner announced that she received Juvéderm lip injections. The interest level in plastic surgery was decreased by 21.3% the month after Joan Rivers' death. Between January 2004 and May 2017, the average interest level for rhinoplasty was significantly different in January/December (67.91 ± 20.68) and June/July (70.12 ± 18.89) from the remaining calendar months (63.58 ± 19.67). Los Angeles, New York City, and Miami showed consistently high interest levels throughout the time period, while Tulsa, OK, showed a major interest increase between 2015 to 2016 of 65 points.

Conclusions A noticeable impact was observed in both celebrity cases on search term volume, and a seasonal effect is apparent for rhinoplasty searches. As many surgeons already employ aggressive Internet marketing strategies, understanding and utilizing these trends could help optimize their investments, increase social engagement, and increase practice awareness by potential patients.

Level of Evidence V This journal requires that authors assign a level of evidence to each article. For a full description of these Evidence-Based Medicine ratings, please refer to the Table of Contents or the online Instructions to Authors www.springer.com/00266.

Keywords Rhinoplasty · Cosmetic surgery · Search trends · Fillers · Google Trends · Social media · Online advertising · Plastic surgery

Introduction

Celebrities have long influenced the medical decisions of the general population. After the wife of former President Ronald Reagan, Nancy Reagan, underwent a mastectomy in 1987, treatment decisions by women of the same race as well as those with lower income and education levels were significantly altered in the following 6 months [1]. Additionally, in March 2000, television personality Katie Couric was motivated by the death of her husband to undergo a live colonoscopy on the "Today" show to increase awareness and promote screenings for colon cancer. This resulted in a significantly higher reported number of procedures for 9 months following the event [2]. More recently, popular culture magazines, including Allure, PEOPLE, and Cosmopolitan, have written articles on the effects of Kylie Jenner on the demand for lip fillers since admitting to undergoing the procedure in 2015. Kylie Jenner, a celebrity and social media trendsetter, is the 8th

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most followed Instagram user in the world with over 96.6 million followers.

The celebrity effect on plastic surgery demand has not always been positive. The ambulatory surgery death of popular television personality and comedian Joan Rivers, even though unrelated to plastic surgery, negatively affected plastic surgery due to her outspoken support, and resulted in ~ 498,000 Google search results for "Joan Rivers Plastic Surgery Death."

While the impact of fashion models in mass media on body image has been extensively studied [3–6], research on the effects of celebrity accounts on social media platforms, such as Instagram, Snapchat, and Twitter, on healthcare decision making is limited [7]. The rising popularity of these social media applications has led to the increased prevalence of celebrity images than ever before. Additionally, potential patients are increasingly able to access relevant medical information online and are becoming better informed prior to their first consultation [8].

Due to the combined effects of increased social media usage and pre-consultation research, we aimed to utilize Google Trends to examine the effects of Kylie Jenner and Joan Rivers on Internet search data for plastic surgery. While marketing companies have been utilizing public opinion, focus groups, and test markets for decades, Google Trends has only recently made it possible for surgeons and small surgical centers to do this on their own. We predicted an increased interest level in receiving lip fillers after Kylie Jenner admitted to undergoing the procedure and a decreased search interest in plastic surgery after Joan River's death. In addition, as young adults are the fastest growing social media user base, we focused on the most popular cosmetic surgical procedure in 2016 for patients aged 13–29, rhinoplasty, and explored seasonal and regional interest trends. We hypothesized higher interest during the summer and winter months, as seen in our clinical practice, when these relatively younger patients are traditionally on break from school.

Methods

We utilized the Explore Topics feature on Google Trends to obtain search data on the terms "Kylie Jenner," "Fillers," "Joan Rivers," "Plastic Surgery," "Cosmetic Surgery," and "Rhinoplasty." The search was geographically limited to the USA.

Kylie Jenner and Fillers

We searched for Kylie Jenner in association with fillers with the terms Kendall and Kim excluded. We then separately searched for the term fillers with multiple exclusions, including Naruto, Bleach, seat, and vase, which left the majority of the search terms related to injectable fillers. Data analysis was performed in Microsoft Excel version 1707. Data were separated into a pre-Jenner announcement group, including data from January 2004 to March 2015, and a post-Jenner announcement group, including data from May 2015 to August 2017. April 2015 was excluded from data analysis as including the announcement month would skew the results. With Excel, we compared the two sets of data using a two-tailed, two-sample equal variance t test and calculated the standard deviation of each data set.

Joan Rivers and Plastic Surgery

We searched for plastic and cosmetic surgery and downloaded data from January 2004 to August 2017. We excluded any mention of Joan Rivers from the search to remove results relating to news of her death. The percent change in interest level between September and October of each respective year was calculated in Microsoft Excel. The average percent change for all years, excluding the year of Joan River's death (2014), was calculated and compared to 2014 using a two-tailed, two-sample equal variance t test.

Rhinoplasty

We searched for rhinoplasty and nose job and downloaded weekly interest data for 2004–2016 individually. Average interest level for January/December and June/July was individually calculated using Microsoft Excel, then each compared using a two-tailed, two-sample equal variance t-test to the average interest level of all months except January, June, July, and December. We also accessed the top 9 most popular metro areas for these search terms by year from 2004 to 2016. Average interest for metro areas that ranked in the top 5 for any year were calculated and ranked. Additionally, we accessed and downloaded the interest data for October 16, 2016, to September 17, 2017.

Due to limitations in the Google Trends tool, we were unable to access data broken down by user age range when searching for the popularity of each search term. Interest level was reported in a relative fashion with 100 assigned to the week or month with the highest number of searches for that particular term. All other values were ranked relative to that date. Numerical data on the number of searches were unavailable.

Results

Before Kylie Jenner's announcement that she receives Juvéderm lip injections, the mean interest level for filler searches was 25.19 with a standard deviation of 5.46. The

mean interest level post-announcement was 55.5 with a standard deviation of 10.82. The *t* test resulted in a *p* value < 0.001, demonstrating a significant increase in interest level immediately after Kylie Jenner's announcement with continued elevated levels of interest for years to come (Fig. 1).

The average yearly percent decrease in interest level between August and September for plastic and cosmetic surgery excluding the mention of Joan Rivers in 2004–2016, excluding 2014, is 3%, while the percent decrease in 2014 is the highest at 21.3%. Clearly a 700% change from the yearly average shows the effect the event had on cosmetic surgical interest (Fig. 2).

The mean interest level for rhinoplasty searches in January/December was 67.91 with a standard deviation of 20.68; in June/July, it was 70.12 with a standard deviation of 18.89; and for the rest of the year, the average was 63.58 with a standard deviation of 19.67. The p-value for January/December was 0.037 and for June/July was 0.0015, showing that there are significant differences in interest in rhinoplasty during these two peak periods and the rest of the calendar year.

The overall regional trends for the 9 metro areas with highest interest levels from 2004 to 2016 for rhinoplasty and nose job show Los Angeles, New York City, and Miami with consistently high interest levels that average 97.54, 92.46, and 83.38, respectively (Table 1). The interest levels from Boston, Dallas–Ft. Worth, and
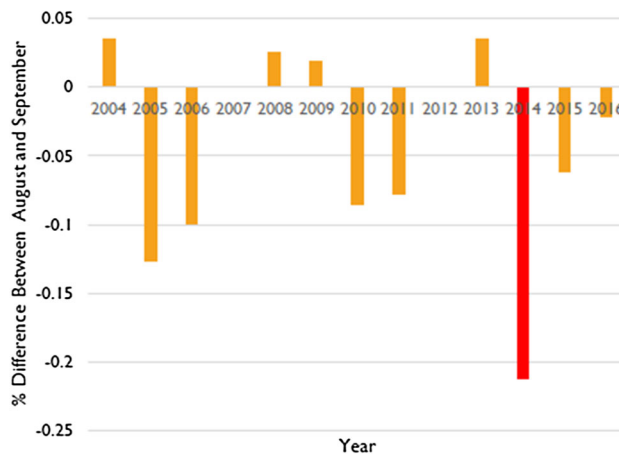

Fig. 2 Percent change in relative Google search interest level for the term, "Plastic surgery + cosmetic surgery − Joan Rivers" from August to September of each year from 2004 to 2016. Average percent change: 3%. Percent change in 2014: 21.3%

Philadelphia are consistently middling with average interest levels of 65.08, 59.31, and 67.46, respectively. The average interest levels for San Francisco and Washington DC are more variable with interest levels of 50.46, 61.08, and 59.00, respectively. Between 2015 and 2016, the interest level of Tulsa, OK, increased by 65. Within the past 12 months, Tulsa, OK, had the highest scaled interest level, with Los Angeles ranking second at a scaled interest level of 49. The average interest level of Tulsa, OK, was
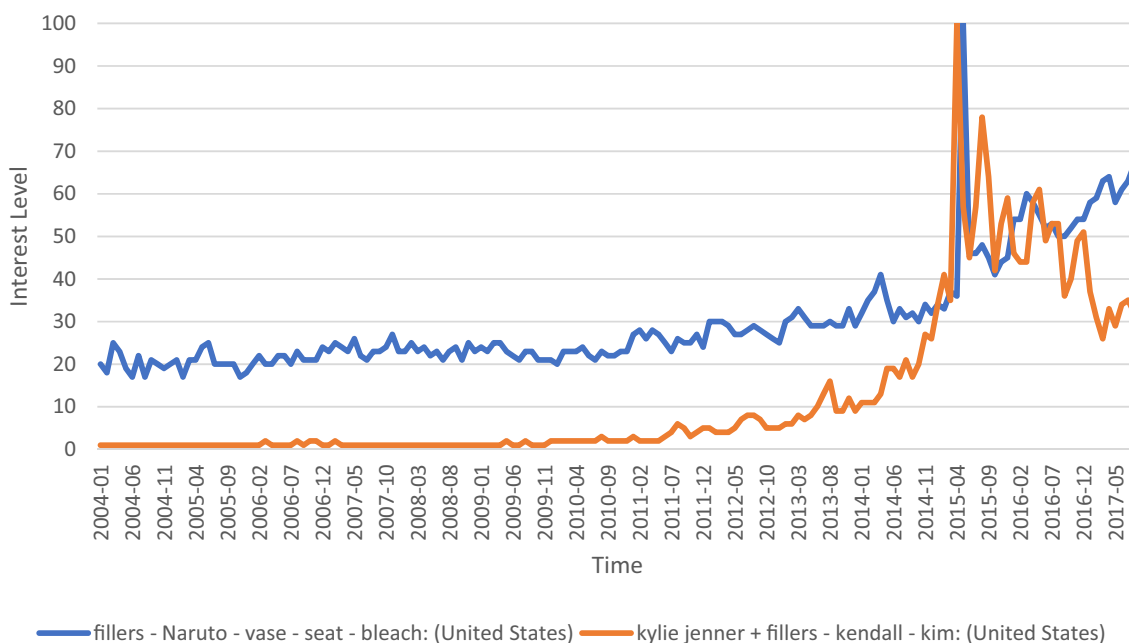

Fig. 1 Relative Google search interest level for "fillers-Naturo-vase-seat-bleach" and "kylie jenner + fillers + kendall − kim" from January 2004 to August 2017. Month with the highest search volume for each term receives the value of 100 and all other values are relative to the search volume of that month. Average filler interest before April 2015: 25.19 ± 5.46. Average filler interest after April 2015: 55.5 ± 10.82

Table 1 Average interest level for the US regions with highest search volume for "Rhinoplasty + nose job" between 2004 and 2016

Los Angeles	97.54
New York City	92.46
Miami–Ft. Lauderdale	83.38
Philadelphia	67.46
Boston	65.08
San Francisco	61.08
Dallas–Ft. Worth	59.31
Washington DC (Hagerstown MD)	59.00
Tulsa, OK	50.46

only 50.46 between 2004 and 2016, making it only the 12th highest metro area by interest in the USA.

Discussion

Patients are increasingly relying on online resources to inform themselves on health-related decisions before seeking medical care [8], but this trend is further magnified by celebrity announcements which pique fan interest in related procedures. This is evidenced by the lasting effect of Kylie Jenner on lip filler results. The lasting spike seen in search data was mirrored by a noticeable increase in the number of hyaluronic acid filler procedures performed from 2014 to 2016 according to the American Society of Plastic Surgeons. There was a reported 9% increase in the number of hyaluronic acid filler procedures done in patients aged 13–19 from 2014 to 2015, compared to a 6% increase from 2013 to 2014 and a 4% increase from 2015 to 2016. More research is required on the causative relationship between plastic surgery Internet searches and the booking of consultations.

Alternatively, the effect of Joan Rivers death was short-lived, but clearly evidenced in our clinical practice by a reduction in purely elective procedures. While not statistically significant due to limited data, the number of searches for plastic surgery unrelated to Joan Rivers in the month following her death decreased by 21.3%, which was the largest drop in 12 years, and 8.6% greater than second highest yearly decrease between 2004 and 2016 and almost 700% percent more than the mean. The shorter-lived impact of Joan Rivers' death was likely due to her relatively lower popularity and social media presence compared to Kylie Jenner. Further research is necessary to explore the relationship between the number of social media followers and the long-term impact of celebrity actions on medical decisions.

According to the American Society of Plastic Surgeons, in 2016 223,018 rhinoplasties were performed with 31,255 performed on adolescents (age 13–19), accounting for 47.11% of procedures performed on patients of this age, making it the most popular procedure for this age category.

Interest in months where students are traditionally on summer or winter break was, on average, 4.33 and 6.54 points higher, respectively, than interest in the remaining months between 2004 and 2016. There are not enough data to prove that school breaks are the cause of this interest peak, but a correlation is apparent.

Overall, plastic surgeons are likely aware of celebrity impact on the potential to lead new patients to online advertising touchpoints. This analysis suggests that it is possible to utilize Google Trends to help determine the extent of the impact of celebrity announcements, regional interest, and seasonal interest on public interest in plastic surgery. Many surgeons currently employ aggressive Internet marketing strategies, and search data can be analyzed to provide concrete information on the most appropriate locations and time periods to increase spending. Since we can accurately tell when and where people are searching for certain procedures, surgeons and surgical centers should tailor and increase their investment in search engine optimization and public marketing around those times. As an example, it would make sense to increase your financial input into digital advertising around the winter/summer months, when we know that rhinoplasty is being searched for more often, and lower spending on advertising in less popular months. Additionally, while Tulsa has had a relatively low interest in rhinoplasty over the past 13 years, it has had the highest interest in the past 12 months, suggesting that Tulsa may be a potentially lucrative market for increased plastic surgery marketing. It is also possible to rapidly determine whether celebrity news has had a significant impact on search trends within plastic surgery. If Google Trends shows a significant spike, this could justify a short-term increase in spending before the news has had time to settle. The absence of a search spike would suggest the news has not had an impact on search trends, and a significant increase in spending would prove wasteful.

With even just a low level of exposure to display advertising, patients have a high probability of engaging in both active and passive searches of the topic [9]. Identifying and understanding the search trends of the greater population can increase social engagement, investment return, and, ultimately, practice awareness by prospective patients.

References

1. Nattinger B, Hoffmann RG (1998) Effect of Nancy Reagan's mastectomy on choice of surgery for breast cancer by US women. JAMA. https://doi.org/10.1001/jama.279.10.762

2. Cram P, Fendrick AM, Inadomi J, Cowen ME, Carpenter D, Vijan S (2003) The impact of a celebrity promotional campaign on the use of colon cancer screening the Katie Couric effect. Arch Intern Med. https://doi.org/10.1001/archinte.163.13.1601

3. Grabe S, Ward LM, Hyde JS (2008) The role of the media in body image concerns among women: a meta-analysis of experimental and correlational studies. Psychol Bull. https://doi.org/10.1037/0033-2909.134.3.460

4. Groesz L, Levine MP, Murnen SK (2001) The effect of experimental presentation of thin media images on body satisfaction: a meta-analytic review. Int J Eat Disord. https://doi.org/10.1002/eat.10005

5. Levine MP, Murnen SK (2009) Everybody knows that mass media are/are not [pick one] a cause of eating disorders: a critical review of evidence for a causal link between media, negative body image, and disordered eating in females. J Soc Clin Psychol. https://doi.org/10.1521/jscp.2009.28.1.9

6. Sc Want (2009) Meta-analytic moderators of experimental exposure to media portrayals of women on female appearance satisfaction: social comparisons as automatic processes. Body Im. https://doi.org/10.1016/j.bodyim.2009.07.008

7. Brown Z, Tiggemann M (2016) Attractive celebrity and peer images on Instagram: effect on women's mood and body image. Body Im. https://doi.org/10.1016/j.bodyim.2016.08.007

8. Montemurro P, Porcnik A, Heden P, Otte M (2015) The influence of social media and easily accessible online information on the aesthetic plastic surgery practice: literature review and our own experience. Aest Plast Surg 39:270–277

9. Ghose A, Todri-Adamopoulos V (2016) Toward a digital attribution model: measuring the impact of display advertising on online consumer behavior. MIS Q 40:889–910