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How U.S. children's hospitals use social media: A mixed methods study



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ABSTRACT

Background: Social media provide new channels for hospitals to engage with communities, a goal of increasing importance as non-profit hospitals face stricter definitions of community benefit under the Affordable Care Act. We describe the variability in social media presence among US children's hospitals and the distribution of their Facebook content curation.

Methods: Social media data from freestanding children's hospitals were extracted from September–November 2013. Social media adoption was reviewed for each hospital-generated Facebook, Twitter, YouTube, Google+ and Pinterest platform. Facebook page (number of Likes) and Twitter account (number of followers) engagement were examined by hospital characteristics. Facebook posts from each hospital over a 6-week period were thematically characterized.

Results: We reviewed 5 social media platforms attributed to 45 children's hospitals and 2004 associated Facebook posts. All hospitals maintained Facebook and Twitter accounts and most used YouTube (82%), Google+ (53%) and Pinterest (69%). Larger hospitals were more often high performers for Facebook (67% versus 10%, $p < 0.01$) and Twitter (75% versus 17%, $p < 0.05$) engagement than small hospitals. The most common Facebook post-themes were hospital promotion 35% (706), education and information 35% (694), community partnership or benefit 24% (474), fundraising 21% (426), and narratives 12% (241). Of health education posts, 73% (509) provided pediatric health supervision and anticipatory guidance.

Conclusions: Social media adoption by US children's hospitals was widespread.

Implications: Beyond its traditional marketing role, social media can serve as a conduit for health education, engagement with communities, including community benefit.

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1. Introduction

Social media, including social networking sites (Facebook.com, Google+), microblogs (Twitter.com), and photograph and video sharing (Pinterest.com, YouTube.com), are changing the speed and depth of interaction between healthcare organizations and the public. Early hospital adoption of social media has focused considerably on marketing.^{1,2} In addition to supporting a hospital's marketing goals, social media can be used for health education, a cornerstone of pediatric primary care, and to promote the population health of communities.^{3,4}

Children's hospitals have a unique social media target audience

that includes both families and children, who interact with social media at increasingly younger ages.^{5–7} Dissemination through social media of timely healthcare messages and promotion of events for the community can result in community benefit, a goal of increasing importance as non-profit hospitals face stricter definitions of community benefit under the Affordable Care Act (ACA).^{8,9} Under this ACA provision, tax-exempt non-profit hospitals are required to conduct an assessment of community needs and develop an implementation strategy to address the identified needs every 3 years.⁸

Little is known about the state of social media engagement and use by children's hospitals. In this cross-sectional mixed methods study, we examined the association between children's hospital characteristics and social media presence, and conducted a content analysis of Facebook themes and engagement. Using these mixed method, we provide a comprehensive description of the social media presence and distribution of Facebook content curation and engagement across free-standing US children's hospitals.

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The mixed methods approach offers a richer description of the social media landscape than either a quantitative or qualitative approach alone.¹⁰ Identifying current patterns of social media use and public engagement among children's hospitals can inform ways to maximize hospitals' social media efforts and its potential to address the ACA's community benefit requirement. We hypothesize that social media adoption by children's hospitals will be high and that public engagement with their social media platforms will be variable.

2. Materials and methods

We examined the social media presence of all 47 freestanding US children's hospitals, which were identified through the Children's Hospital Association.¹¹ Freestanding children's hospitals rather than combined adult–pediatric hospitals were selected to allow for focus on the social media efforts directed towards children and their families. We excluded two freestanding children's hospitals with shared social media accounts for a larger affiliated children's hospital or its affiliated adult hospital, resulting in 45 children's hospitals analyzed in our sample.

2.1. Data collection

2.1.1. Social media platform adoption and engagement

In October 2013, we reviewed each hospital's presence on five social media platforms: Facebook.com, Twitter.com, YouTube.com, Google+ (plus.google.com) and Pinterest.com. These platforms were selected since they are created and maintained by the children's hospitals and had widespread popularity, free public access, and accessible usage metrics.^{5,12}

We reviewed the main hospital-generated page for each platform, which was identified by searching each children's hospital homepage for social media platform links or icons. If the hospital website did not feature links to social media pages, we searched within each social media platform, confirming connections with hospital address or logo. Only the main hospital-generated social media page or account was examined for each platform.

All extracted data were readily available, publicly shared, and complied with the sites' Terms of Use. On Facebook, for example, hospitals have control over how their data is shared via privacy and application settings.¹³ No social network connections (e.g., friend or follow) or postings were made between the research team and the hospital social media sites in order to gain access to data. Hence, our data did not require de-identification or contact with the hospitals. No data were extracted from the accounts of individual social media users, only each hospital's main social media site on the five study platforms.

For each hospital, we measured the date of adoption of Facebook or Twitter accounts and the public engagement with those accounts. *Facebook page engagement* was measured as the number of Facebook page likes; *Twitter account engagement* was defined as number of Twitter followers. We also assessed the number of tweets posted by each hospital since joining Twitter. We assessed the modal age group that most commonly used each hospital's Facebook page, which is a publicly available metric provided by Facebook. For YouTube.com, Google+ and Pinterest.com, the presence or absence of a hospital-generated site on each of these platforms was recorded per hospital.

We used data from the Children's Hospital Association to characterize hospital location and size.

2.1.2. Facebook content analysis

After identifying each hospital's main Facebook page, we reviewed the content of all posts for each hospital over a six-week

period (September 22, 2013 – November 2, 2013) ($n=2004$). We took screenshot digital images of each Facebook post since many posts use images or infographics with or without text. We assessed engagement with each Facebook post. *Facebook post engagement* was defined as the total number of likes, comments, and shares on each post two weeks after each post date; this lag period allowed for stabilization of the engagement metrics.¹⁴

For the content analysis of Facebook posts, study team members (CW, GO) developed a structured thematic codebook through an iterative process.¹⁵ The digital image for each Facebook post was examined, and a set of initial codes and definitions were proposed. A primary thematic code and, if appropriate, a secondary theme were assigned to every post. Thematic categories for anticipatory guidance, such as safety, nutrition and development, were based on the American Academy of Pediatrics domains of health supervision and anticipatory guidance.³ Coding discrepancies were discussed by the analysis team, and the codebook was revised as relationships among coded thematic categories and broader conceptualizations were identified. Two investigators independently coded 10% ($n=200$) of the Facebook posts. Inter-coder reliability on the primary theme outcome was assessed using a kappa score. A post was assigned a thematic code if it appeared as either the primary or secondary theme, with no weighting assigned to either theme since many posts equally fit into two themes (e.g., a disease awareness post that used a narrative story).

2.2. Data analysis

2.2.1. Social media platform adoption and engagement

Descriptive statistics, including medians and interquartile ranges, were used for adoption metrics across all five social media platforms, Facebook page engagement (number of likes) and Twitter account engagement (number of followers). Hospitals with the Facebook page engagement or Twitter account engagement above the means (Facebook > 26,218 likes and Twitter > 7951 followers) were defined as high performing US children's hospitals on Facebook and Twitter, respectively. Facebook page and Twitter account engagement outliers were defined as those greater than two standard deviations above the means. Social media platform adoption, Facebook page engagement and Twitter account engagement metrics were compared by hospital characteristics using chi-square statistics. Hospital size was categorized as small (lowest quartile, ≤ 206 beds), medium, and large (highest quartile, ≥ 371 beds).

To display the geographic distribution of social media engagement across hospitals, each hospital was geocoded based on street address in ArcGIS version 10.1 (ESRI; Redlands, California) and presented in map figures. Pairwise correlations between Facebook and Twitter engagement and the population of the hospital's city were performed. The association between the timing of Facebook and Twitter adoption and their engagement metrics were assessed by pairwise correlation coefficient. The association of between timing of Facebook and Twitter adoption and hospital characteristics was tested with linear regression.

2.2.2. Facebook content analysis

Facebook post engagement was defined as the sum of the number of likes, shares and comments for each post and is presented as overall descriptive statistics, including means, medians and interquartile ranges. Since each hospital's level of overall Facebook page engagement varied substantially, each post's engagement was standardized by hospital. Standardized Facebook post engagement was calculated as the ratio of the individual Facebook post engagement to the hospital's average Facebook post engagement during the study period, regardless of post theme. The mean of standardized Facebook post engagement within each

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