A Picture Really is Worth a Thousand Words: Public Engagement with the National Cancer Institute on Social Media

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Abstract The National Cancer Institute (NCI) provides pertinent information about cancer prevention, treatment, and research advancements that is considered objective and accurate. NCI's presence on social media is an example of a growing effort in promoting and facilitating audience engagement with evidence-based information about health and cancer. However, it is unknown what strategies are most effective for engaging audiences via this communication platform. To evaluate this important question, we analyzed data on posts, associated comments, and meta-data from official NCI Facebook page between July 2010 and February 2015 (end of data collection). Results show that audience engagement is associated with the format of cancer-related social media posts. Specifically, posts with photos received significantly more likes, comments, and shares than videos, links, and status updates. The findings have important implications for how social media can be more effectively utilized to promote public engagement with important public health issues.

Keywords Information dissemination · Audience engagement · Social media · Cancer research

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Background

The National Cancer Institute (NCI) is a source of objective, accurate, and pertinent information about cancer prevention, treatment, and research advancements. The proliferation of social media provides an opportunity to reach more audiences with evidence-based cancer information. The effectiveness of these dissemination efforts depends on the active consumer engagement with the provided information [1, 2]. However, it is still largely unknown what message strategies are most effective for engaging audiences via this communication platform. The goal of this study was to assess the role of information richness of the messages disseminated by the NCI through Facebook and the relative effectiveness of these social media messages to promote engagement with cancer prevention and research information.

The Internet is widely used as a convenient source of information and a channel used to help the public make informed healthcare decisions [3]. A recent study reported that 59 % of cancer patients use the Internet and 7.5 % use online fora as primary sources of health information [4]. Active health information-seeking is associated with higher levels of health literacy and health-enhancing behavior change [5–7]. Additionally, active engagement in information transfer leads to increased levels of health empowerment and self-efficacy [8–10].

Online information dissemination and outreach activities can be effective mechanisms to raise awareness of cancer research and existing cancer-related resources [11]. Social media also provide an ideal platform to assess audience base, audience engagement with information, and receive comments from more active information consumers. The volume, complexity, and inconsistent quality of health information on the internet make efficient searches for credible health information problematic for many consumers [3]. Facebook pages have a potential to create focused channels for their target audiences and thus help the discovery of relevant and reliable

information on the Internet. However, the efforts to disseminate accurate and understandable information through social media should include strategic plans to make the information appealing to target audiences. Social media comprise a unique medium for disseminating evidence-based cancer information to diverse stakeholders and facilitating active dialog about these topics [5, 12, 13].

Social media facilitate the exchange of information with varying degrees of richness. According to the theory of information richness (IRT), text is less rich than images and videos are considered richer than images, but the appropriate level of information richness is situation-dependent [14]. Guided by the IRT, we examined information exchange on the NCI Facebook page. Our guiding research questions were:

RQ₁: How is the information richness of a post associated with audience engagement?
RQ₂: What research-related posts are more effective for audience engagement?

Methods

The data included posts on the official NCI Facebook page between July 2010 and February 2015 (end of data collection), associated comments, and meta-data. Facebook is the largest social media platform with 1.49 billion active monthly users [15]. Organizations can create individual pages to share information, news, and updates with users by creating posts. By "liking" a page, users can access updates and engage with this content through commenting on, sharing, or liking the individual posts.

At the time of data collection, 152,482 users liked the NCI Facebook page. Posts submitted by the NCI to its page and associated comments were collected and coded as research or non-research based on the presence of predefined keywords "study" OR "studies" OR "research" OR "trial" OR "paper" OR "article." All key variables showed positively skewed distributions which could not be transformed. Therefore, non-parametric statistics were used to identify significance of the differences in user engagement by post type. The Kruskal-Wallis and Tamhane post hoc tests were used to compare the types of audience engagement across the media forms.

Results

Data included 1975 posts and their associated data, including 4537 comments, 77,298 shares, and 145,462 likes (see Table 1). The content of the posts included links, photos, videos, status updates, events, and music. Links to stories were the most popular messages type ($N=1319$, 66.8 %), followed by photos ($N=507$, 25.7 %), videos ($N=75$,

Table 1 Descriptive statistics of audience engagement with the NCI Facebook posts

	N (%)	M (SD)	CI (95 %)
Overall user engagement with posts ($N=1975$)			
Comments	4537	2.30 (4.18)	2.11–2.48
Shares	77,298	39.14 (93.95)	35.01–43.27
Likes	145,462	73.65 (144.33)	67.28–80.02
Engagement with non-research posts ($N=1259$, 63.75 %)			
Comments	3293 (63.75 %)	2.62 (4.67)	2.36–2.87
Shares	61,669 (72.58 %)	48.98 (108.62)	42.98–54.99
Likes	107,871 (79.78 %)	76.63 (163.77)	76.63–94.73
Engagement with research-related posts ($N=716$, 36.25 %)			
Comments	1244 (36.25 %)	1.74 (3.06)	1.51–1.96
Shares	15,629 (27.42 %)	21.83 (54.61)	17.82–25.83
Likes	37,591 (20.22 %)	52.50 (98.09)	45.30–59.70

3.8 %), and status updates ($N=70$, 3.5 %). Events and music posts accounted for less than 0.5 % of content and were excluded from the analysis.

For RQ₁, user engagement varied significantly across post types for the number of posts, $\chi^2(df=3, N=1971)=815.21$, $p<0.01$ comments, $\chi^2(df=3, N=1971)=377.84$, $p<0.01$, and shares, $\chi^2(df=3, N=1971)=889.62$, $p<0.01$. Posts containing photos were associated with a significantly higher number of audience comments, shares, and likes than other strategies (i.e., videos, links, status updates).

For RQ₂, descriptive analysis showed that links ($N=532$, 74.30 %) and photos ($N=138$, 19.30 %) were the top two types of content for research-related posts followed by videos ($N=29$, 4.1 %) and status updates ($N=17$, 2.4 %). However, a chi-square test and a review of standardized residuals revealed that research-related posts came as links significantly more often than photos, $\chi^2(df=3, N=1971)=31.90$, $p<0.01$ compared to non-research posts. User engagement with research-related posts varied significantly across post types for comments, $\chi^2(df=3, N=716)=92.17$, $p<0.01$, shares, $\chi^2(df=3, N=716)=225.28$, $p<0.01$, and posts, $\chi^2(df=3, N=716)=185.29$, $p<0.01$. Photos received more audience comments, shares, and likes compared to links and videos, but no differences were identified for status updates.

Discussion

Results of this exploratory study show that large audiences can be actively engaged through social media. However, the format of the shared information plays an important role in attracting attention and engagement. Messages with photos are more effective than videos, links, and status updates for encouraging public engagement with cancer-related content. Applied to the framework of the information richness theory (IRT) [14], these findings suggest both

theoretical and practical implications related to the effective transfer and understanding of communicated information. This study allows formulating two theoretical propositions. First, information richness is situational with different levels of richness being more preferred by the audience. Second, information richness is a mediating variable for audience engagement.

Conclusions presented in this paper have high external validity. Information sharing and audience behavior observed on social media platforms allow the exploration of theoretical questions in real-life situations. With a number of possible data points generated in the process of communication on social media, a focused examination of a limited data set would be necessary for the examination of theory-driven research questions. The data analyzed in this study was limited to one source, the NCI Facebook page. While government organizations provide reliable, accurate information, other Facebook pages are drawing much larger and, potentially, more diverse audiences. Future studies could provide a comparative analysis among several representative Facebook pages to confirm general trends in audience information behavior and engagement.

The type of the data analyzed and reported in this study presents a strength and a limitation. On the one hand, the data are non-intrusive and observational, but, on the other hand, it provides a limited opportunity for follow-up exploration of observed communication and information behavior. The analysis presented in this article provides evidence of the active information behavior by social media audiences but cannot capture passive information consumption and lurking. Continuing this line of research, surveys could help uncover latent audience motivations for active and passive information behavior. Furthermore, carefully designed experimental studies could provide evaluation of the effectiveness of focused communication strategies and individual message designs.

Practical implications of this research suggest that photos with short comments are the most effective in engaging information consumers, and greater use of this post type for research-related posts could encourage greater audience engagement with information about cancer studies and discoveries. At the same time, professional videos, sometimes viewed as a more effective, rich yet more expensive source of information [13], may not be as effective as a mechanism for active audience engagement on social media platforms. Future research could assess how length or other characteristics of videos affect user interest and engagement and if there is a more appropriate mode of communication when richer information is expected. However, based on the data presented in this study, organizations involved in the dissemination of information related to health and medical research could succeed in their audience engagement efforts by using messages with photos and pictures as a more cost-effective communication strategy.

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