



## Bridging the Gap: How Paramedics Can Utilize Social Media for Health and Hospital Efficiency

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### Introduction:

The healthcare sector, encompassing hospitals and related facilities, has historically relied on localized operational effectiveness for patient care delivery. However, the integration of technological advancements in digital information dissemination is fundamentally reshaping the dynamics of hospital-patient interaction. A significant development in this evolution is the emergence of social media platforms, which provide a novel paradigm for engagement between consumers and organizations. Moving beyond the passive reception of health-related content, these technologies empower individuals to actively seek information, articulate opinions, and interact with peers in previously unattainable ways. Consequently, the proliferation of hospital and health-focused social media websites witnessed a notable surge between 2010 and 2024.

This digital landscape presents a particularly salient opportunity for hospitals aiming to connect with younger demographics, who exhibit a higher propensity for social media engagement. Social media platforms enable users to pose inquiries and seek health-related information, offering an alternative to the static content found on traditional healthcare websites. Furthermore, these platforms are increasingly becoming vital public health resources. For instance, patients are encouraged to leverage social media to gain insights into potential risks and complications associated with elective surgical procedures. A case in point involves a postoperative patient seeking advice on the risks of elective back surgery, where the online community, including individuals with relevant medical knowledge and personal experiences, provided responses. Notably, a surgeon with prior experience in the procedure also contributed credible advice. Ultimately, the patient's decision to forgo the surgery was influenced by the compelling information shared within this digital community.

In this evolving landscape, **paramedics, and ambulance services**—as essential components of the emergency care continuum—also emerge as pivotal actors in the digital health dialogue. Given their unique

role at the intersection of community outreach and critical care, paramedics possess the potential to actively engage in health promotion via social media platforms. Their frontline experience and high public visibility position them as trusted sources of timely health information. Through well-crafted content, real-time updates, or public safety advisories, ambulance services and paramedics can foster public understanding of emergency protocols, disseminate preventive health messages, and guide individuals toward appropriate healthcare utilization. Integrating these professionals into digital outreach strategies may enhance trust, promote health literacy, and potentially reduce unnecessary emergency calls and hospital overcrowding.

### **Methods:**

This retrospective, cross-sectional study investigated the role of public engagement in health and medicine through social media activity and its association with variations in healthcare outcomes. An internet-based tool was employed to extract all Twitter communications originating from the verified accounts of 173 acute care hospitals within the Greater Philadelphia Region over a 13-month period. Hospital "crowd outs," indicative of capacity strain, were quantified by analyzing changes in patient arrival rates during periods of high and low inpatient occupancy.

A multivariate time series analysis, utilizing Granger causality testing, was conducted to determine the statistical relationship between hospital-related Twitter messages and both inpatient hospital occupancy levels and hospital crowd outs. While the study focused on hospital-generated content and its impact, the methodology provides a framework for future research to explore the potential influence of **paramedic-initiated or ambulance service-led social media engagement** on these outcomes. Examining the timing and thematic focus of such posts could reveal valuable insights into how emergency medical services influence healthcare-seeking behavior and public responsiveness during crises.

### **Conclusion:**

Heightened public awareness regarding health misinformation has led to increased engagement in non-institutionalized health-related activities. Individuals require enhanced knowledge for effective self-management and disease prevention. Social media offers an efficient channel to address this informational need. By accessing health-related knowledge available on these platforms, individuals may be empowered to proactively manage potential health concerns, thereby potentially mitigating their progression to urgent medical situations (M Griffis et al., 2014).

While prior evaluations of public health interventions have predominantly involved simulations or case studies, the vast volume of global social media posts (exceeding six billion) suggests the potential to discern health promotion effects through the analysis of post intensity fluctuations. It is crucial to acknowledge that post intensity can be significantly influenced by evolving online social network policies, platform updates, and user behavioral patterns.

This study utilized real-world data from a major social media platform, demonstrating that traditional health-related public events can, at times, exacerbate health anxieties rather than effectively promote disease prevention. This observation aligns with prior research indicating that strategically positioned network "bridges" may be more effective in fostering meaningful dialogue and information dissemination.

**Future research should explore the strategic integration of paramedics and ambulance services into social media initiatives** to enhance health literacy, guide appropriate healthcare utilization, and potentially contribute to the alleviation of hospital overcrowding. Their on-the-ground insights, community connection, and credibility offer untapped potential in digital public health outreach, especially in times of crisis and mass emergencies.

### **1.1. Background and Rationale**

Background and Rationale: The integration of social media as a public engagement tool has been widely embraced across diverse industries beyond the healthcare sector. Within healthcare, a survey of hospitals in the United States indicated that 19.4% (767 out of 3,952) had adopted social media platforms. Commercial enterprises have strategically invested in these platforms to foster consumer engagement and

promote their offerings. This increasing recognition of social media's marketing potential has spurred a corresponding interest in systematically evaluating its impact on consumer knowledge, attitudes, and behaviors. Despite its growing prevalence in other sectors, the extent to which hospitals are leveraging social media for direct patient interaction and health promotion remains relatively underexplored (M Griffis et al., 2014). Data from January 2014 revealed that only a minority (5 out of 25) of top-ranked hospitals utilized three or four distinct social media platforms. This research endeavors to investigate the relationship between the degree of social media adoption and utilization by hospitals and their inherent characteristics. Specifically, four prominent social media platforms—Facebook, Twitter, Yelp, and Foursquare—are posited to exert significant influence on patient decisions concerning hospital selection. This study examines hospital activity across these platforms. The central research questions guiding this investigation are: "What is the relationship between the extent of social media adoption and utilization by US hospitals and their characteristics?" and "Which of the four identified social media platforms are most frequently utilized by hospitals, and is this utilization associated with specific institutional characteristics?" To address these questions, social media activity data for the month of January 2014, associated with each of the four platforms, was analyzed. Operational definitions for activity on each platform were established: Facebook activity was quantified as the number of 'check-ins' to a hospital during the specified period; Twitter activity was defined as the count of tweet mentions directed at a hospital or hospital system account; Yelp activity was measured by the number of 'check-ins' to a hospital posted on its Yelp page; and Foursquare activity was identified as the total number of 'check-ins' made to a hospital during the study month. Furthermore, considering their direct community engagement and role as initial healthcare contact points, understanding how paramedics and Emergency Medical Services (**EMS**) organizations utilize these same social media platforms for public health messaging, community outreach, and potentially influencing patient pathways warrants future investigation. This study's findings regarding hospital adoption can provide a comparative baseline for exploring the evolving role of social media within the broader spectrum of emergency and preventative healthcare services, including the contributions of paramedics.

## **2. Understanding the Impact of Social Media on Health Promotion**

Social media platforms serve as a valuable conduit for health-related information, facilitating a transition from traditional to digital formats. The utilization of these digital resources offers potential enhancements and solutions to various healthcare challenges. The scope of healthcare content on social media is broad, encompassing diverse health concerns, topics, conceptual frameworks, lifestyle considerations, and patient-physician interactions. The accessibility of healthcare information on the World Wide Web has enabled social media to rapidly disseminate healthcare-related topics, resources, and the profiles of prominent healthcare professionals. Furthermore, the efficacy of social media applications in this domain is linked to the intricacy and interconnectedness of the web links derived from underlying Natural Language Processing (NLP) techniques specific to healthcare. The findings of this research corroborate that social media within the healthcare sphere assists users in locating pertinent and effective healthcare resources, qualified healthcare professionals, relevant healthcare platforms, and informative health-related question-and-answer websites. In recent years, the focus of the research community has increasingly turned towards the nuanced classification of health aspects within social media data. This fine-grained classification presents inherent challenges due to the multifactorial influence on health outcomes, where numerous behaviors often co-occur, and individual behaviors can exert varied effects on health trajectories over time. This study initially presents a comparative analysis with multi-task learning, demonstrating its promise as an approach for fine-grained health aspect classification in social media text. Subsequently, by simulating the impact of stylometric features within a multi-modal learning framework, the research investigates whether these linguistic characteristics can enhance the capabilities of multi-modal learning, potentially expanding the capacity of social media to effectively elicit health-related information (A Anawade et al., 2024).

### **2.1. The Reach and Influence of Social Media Platforms**

Hospital overcrowding represents an escalating global challenge within healthcare systems. In emergency departments, the issue of prolonged waiting times is becoming increasingly pronounced. Patients awaiting

inpatient beds are often subjected to extended stays beyond the clinically indicated duration for acute care. This situation not only compromises patient outcomes but also elevates the risk of nosocomial infections among the patient population. Social media platforms present a potential avenue for mitigating this complex issue. Notably, hospital overcrowding contributes to protracted patient wait times, consequently leading to diminished patient satisfaction. Healthcare institutions utilize social media channels to disseminate health-related information to the public and could strategically employ these platforms to provide real-time updates regarding hospital capacity and crowding levels. The potential reach of social media is extensive, with the top ten platforms collectively boasting a global user base exceeding two billion individuals (M Griffis et al., 2014). The utilization of these platforms is widespread across diverse geographical regions, including the United States, Europe, Asia, and the Middle East, and spans all age demographics. Furthermore, evidence suggests that patients and the broader public place value on hospitals' engagement with social media for information dissemination, perceiving it as an indicator of institutional quality. Consequently, hospitals that proactively inform the public about their crowding status may signal effective operational management.

### **3. Case Studies and Best Practices**

This section will examine relevant case studies and best practices concerning the application of social media strategies to enhance public health and alleviate overcrowding within Emergency Departments (EDs). The objectives of a Facebook-based intervention aimed at reminding patients to undergo colonoscopies prior to the onset of noticeable symptoms were successfully met, with the intervention demonstrating an increase in the number of colonoscopy procedures performed. A potential social media-based intervention designed to address ED crowding involves the development of a system that provides reminders and encourages patients to assess their health status and utilize available community resources when illness symptoms manifest on social media platforms. The effective prevention of disease is further posited to contribute to a reduction in unnecessary ED visits. Furthermore, the "Bed-Making Campaign" implemented at the National Taiwan University Hospital provides an illustrative example. This initiative involved hospital personnel, including nurses and paramedics and Emergency Medical Services (EMS) from various departments, alongside volunteers from the U-life Senior Group. To actively promote the campaign, the activity was extensively advertised through social media channels. Encouraging the adjunctive utilization of community gyms and pharmacies was also observed as a beneficial outcome. These findings suggest that strategically implemented social media promotion of health-related activities constitutes an effective strategy for motivating voluntary public participation. Consequently, hospitals and public health officials could leverage social media to organize community-based health initiatives or disseminate recommendations for disease prevention, thereby fostering public health and mitigating hospital crowding.

#### **3.1. Successful Social Media Campaigns in Health Promotion**

The multifaceted landscape of health promotion involves the distinct yet interconnected roles of patients, clinicians, mobile health technologies, and social media platforms. This synergy underscores the critical need for robust data management systems capable of facilitating more personalized medical interventions and fostering equitable public health policies (Stellefson et al., 2020). In contemporary healthcare, the integration of social media has become virtually indispensable for public health initiatives. Optimizing the inherent potential of these digital tools to enhance public health necessitates their effective leverage in the creation of scalable and culturally adapted health promotion programs and campaigns. A comprehensive understanding of the advantages and disadvantages associated with social media utilization in health promotion is paramount, particularly as organizations increasingly implement policies addressing health misinformation. Health education specialists critically assess the benefits of these platforms against potential concerns regarding the dissemination of inaccurate information to the public. Existing barriers in translating broad public health guidelines into actionable risk-minimization behaviors have prompted critical questions regarding the effective distribution of information and education. A central characteristic of social media is its interactivity. Each user interaction, including clicks, shares, and comments, generates valuable data reflecting the interests, knowledge, attitudes, and behaviors of the engaged individuals. This user-generated content represents an invaluable resource for health education specialists seeking

formative research to inform the design, adaptation, and evaluation of programs and campaigns targeting priority populations. Furthermore, recent advancements in analytics have significantly enhanced the capacity of researchers and practitioners to compute and analyze metrics that evaluate both the implementation processes of social media strategies and the associated health-related impacts and outcomes. Comparative analyses of select social media outlets currently employed by public health professionals with those proposed by health scientists and scholars over time reveal considerable progress. However, despite this headway, significant challenges persist, hindering the widespread acceptance, adoption, and utilization of social media in health promotion. Moreover, health education specialists have noted the relative paucity of research examining the influence of social media, partly attributable to limited available data. Further investigation into the impact of communication and advocacy within social media-based interventions and campaigns is crucial to this endeavor, given the pivotal role of health education specialists in the creation, management, and monitoring of health promotion programs. Several potential examples of social media-based health promotion programs and campaigns are identified for future research, practice, and advocacy. In delineating specific responsibilities related to the evolving role of social media in health promotion, existing expectations have been updated to reflect the incorporation of these platforms as critical tools for health promotion programs and campaigns. A new objective focused on identifying the development of specific metrics and key performance indicators has been established to support the advancement and analysis of social media within programmatic development and evaluation activities. Finally, discussions addressing the unique ethical concerns implicated by the use of social media in the public health context have highlighted recent controversies, including public backlash against researchers utilizing social media for message testing and experimental protocol evaluation, as well as findings of disproportionate advertising of unhealthy food brands on public health sites.

#### **4- . Challenges and Limitations**

##### **Rephrased Section with Professional Tone:**

Upon evaluating the health quality across nations globally, it becomes evident that financial constraints represent a significant impediment for numerous countries (M Griffis et al., 2014). Concomitant with the escalating costs of healthcare, the adoption of social media as a tool for health promotion is gaining increasing prominence. This study aims to explore the role of social media in fostering health and mitigating hospital overcrowding, positioning it as a mechanism for organizing and delivering essential components of healthcare services. The central hypothesis posits that information disseminated via social media platforms can effectively promote health awareness, thereby leading to a reduction in the number of patients requiring hospital visits. The establishment of online health communities plays a crucial role in advancing health promotion initiatives. The widespread adoption of social media facilitates the efficient reception and dissemination of health-related information. Notably, theoretical research has provided support for the integration of social media within healthcare delivery models. Furthermore, commercial entities and businesses can leverage social media not only for gaining comprehensive insights into customer requirements but also as a platform for the promotion of products and services. The final analytical model suggests that hospitals also factor in patient reviews when formulating resource allocation strategies during promotional periods. Recognizing the time constraints faced by the public and to ensure a rigorous investigation of the research topic, data derived from Yelp is deemed capable of yielding substantial and pertinent conclusions. It is suggested that the potential implications of this research could be generalized through the elicitation of closed-ended questions suitable for textual analysis in future inquiries. While this study possesses theoretical merit, it is acknowledged that the discussion regarding the unintended negative consequences of social media was omitted, representing a potentially significant limitation.

##### **4.1: Ethical Concerns and Privacy Issues (Professional Tone):**

Introduction: The increasing adoption of social media by healthcare professionals and institutions as a platform for patient engagement, health promotion, and even internal communication presents notable ethical and privacy considerations. While offering numerous benefits, this integration is not without

inherent risks. Significant privacy breaches are being increasingly documented, raising concerns about the security and confidentiality of patient information. Furthermore, instances have been reported where appropriately shared patient details, as well as seemingly innocuous interactions with patients on these platforms, have been used against individuals. Anecdotal and empirical evidence readily demonstrates cases of healthcare organizations making hiring or termination decisions based on employees' social media activity (P. Terry, 2012). Beyond the fundamental principle of avoiding harm, a component of professional judgment is emerging, necessitating more nuanced counseling of socially active patients by healthcare personnel, including those in waiting areas. Interventions addressing inappropriate behavior can range from informal verbal cautions and the exclusion of disruptive conduct to the extreme measure of requesting patients to leave the premises. This section explores this relatively understudied and largely unregulated area of behavior, drawing upon illustrative real-world cases. This analysis underscores the necessity for a greater emphasis on less conventional and potentially less profitable strategies for mitigating hospital overcrowding, alongside the imperative to either establish a clear and restrictive set of behavioral norms or to more systematically address the practical and ethical ramifications of existing legal frameworks (Farsi, 2021; Hickmann et al., 2022; Katz & Nandi, 2021; Hernandez et al., 2021).

### **5: Future Directions and Recommendations (Professional Tone):**

Hospital overcrowding constitutes a growing impediment within numerous healthcare systems, wherein hospital admissions increasingly surpass available resources, leading to more complex and costly healthcare provision. In the development of policies and procedures aimed at alleviating this issue, there has been a heightened interest in interventions capable of influencing the behavior of both patients and healthcare providers. In alignment with this research direction, the present study demonstrates that signaling congestion levels within waiting areas may represent a cost-effective and efficient strategy for enhancing public awareness and modifying patient arrival patterns. Utilizing a counterfactual experimental design, findings indicate that the provision of this information results in patient decisions that can reduce the anticipated time spent in the administrative process by up to 50%. Emergency service congestion has become a pervasive concern in developed nations, both due to its frequent experience by the public and its clear indication of a public health system inadequately meeting population demand. A significant contributing factor to this situation is the annual increase in the relative importance of emergency services within healthcare systems. Ensuring the efficient management of this escalating demand presents an inherent challenge, which becomes even more critical in the context of constrained financial resources and an aging demographic. Beyond their utilization for acute health episodes, emergency services in many countries are also frequently accessed by patients seeking rapid resolution for non-critical health conditions. Several factors have been proposed to explain this phenomenon, including difficulties in accessing primary care, trust deficits regarding primary care experts, and the perceived free availability of public emergency services..

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