

Title: Impact of Geographic Location on Online Patient Engagement in Rural Orthopedic Population

Introduction/Research Objective:

Rural patient population presents a challenge for delivery of proper follow-up and continuity of care to hospitals and health systems. According to National Rural Health Association, there are 30 specialists per 100,000 residents in rural areas versus 263 specialists per 100,000 residents in urban areas. As a result, patients in rural communities are located farther away from their medical providers compared to those who live in more urban settings - resulting in longer travel and time off work. Expanding healthcare access to rural areas seems like a simple solution, but it is not a cost- and time-efficient solution as it requires a considerable up-front costs and long-term planning. Over the years, many hospitals and health systems have begun to identify digital health as a potential solution. The objective of this study is to describe and evaluate the impact of patients' geographic location on their engagement on the interactive online rehabilitation platform.

Study Design:

A retrospective review was conducted on 980 patients who underwent a total joint arthroplasty at a health system in a rural/non-urban community. Patients were divided into two groups based on their geographical location ($\geq 15\text{km}$ away from hospital versus $< 15\text{km}$ away from hospital), which was determined by the Haversine Formula calculating the great-circle distance between two points (shortest distance over the earth's surface; e.g. "as-the-crow-flies"). Patient groups were compared on the following engagement metrics: number of logins, time spent on the platform, post-op video views and messages sent. T-tests were used for comparison and $p < 0.05$ was deemed statistically significant.

Population Studied:

980 patients who underwent a total joint arthroplasty across one health system (*Geisinger Health, PA*) and provided their 5-digit home zip codes were included in the study. Patients were enrolled in the online rehabilitation platform that offered multi-format (text, image, video) communication and video-based post-surgical education (*Force Therapeutics, NY*)

Principal Findings:

Overall, patients living 15km+ from their hospitals ("Remote patients") showed higher levels of engagement. They had significantly higher number of logins ($p < 0.05$), times spent on the platform ($p < 0.05$) and post-op video views ($p < 0.05$) compared to those living closer ($< 15\text{km}$) to their hospitals. Also, although not quite statistically significant, Remote patients showed a trend towards sending more messages to their care teams.

Conclusions:

Findings show that remote patients tend to be more inclined to use an online platform for their post-surgical care. This could indicate that online platform could be a viable solution to the lack of access issue posed by rural populations. Key is to sustain rural patients' engagement via highly personalized interactions and content.

Implications for Policy or Practice:

Digital health could be a cost- and time-effective solution to address health equity for rural, underserved communities.