Prospective Randomized Controlled Trial Using Telemedicine for Follow-up Visits in an Orthopaedic Trauma Population: A Pilot Study

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Background/Purpose: Proper follow-up is critical for patients sustaining orthopaedic trauma injuries. However, barriers to follow-up include inadequate finances, time away from work, large distances required to travel, and lack of transportation. Despite these challenges, many patients have home access to high-speed Internet. Therefore, the use of telemedicine (TM) video calls may be an alternative to in-person clinic visits as a solution to these barriers to follow-up. The purpose of this prospective, randomized controlled pilot trial is to investigate the feasibility of TM as a mechanism for follow-up in the orthopaedic trauma population.

Methods: After IRB approval, 24 total patients were recruited based on power analysis. Patients were recruited at the 2-week follow-up visit with inclusion criteria consisting of: age >18 years, closed fracture initially evaluated at the university, and access to TM video calls. Patients were randomly assigned into the control (C) (n = 12) or TM (n = 12) group. All patients had 2-week, 6-week, 3-month, and 6-month follow-up visits in this study. C patients had all visits in person at the university's clinic, while TM patients had 6-week and 6-month follow-ups occur through video calls. Prior to these two video calls, TM patients obtained radiographs of their fractures at local facilities that electronically submitted these radiographs to the university. Patients answered Likert-style surveys (1 = very unsatisfied, 2 = unsatisfied, etc) detailing their experiences at the conclusion of the study. Statistical analyses comparing patient satisfaction between the two groups were conducted with Mann-Whitney U tests.

Results: 12 patients were recruited into each arm of the study. 9 control patients (3 lost to follow-up) and 8 telemedicine patients (3 lost to follow-up, 1 sustaining an open fracture) completed the study. There were no significant differences between the C and TM group with satisfaction and complications (Table 1). Significantly fewer patients in the TM group (n = 0, 0%) took time off from work for appointments compared to the C group (n =5, 56%) (P = 0.03). In the TM group, patients traveled significantly fewer miles for a radiograph at a local facility (average 14.1 miles) compared to traveling to the university for in-person radiographs and visit (average 53.8 miles) (P <0.001). The TM group spent significantly less time per visit for video calls, including travel time for radiographs (79.4 minutes) when compared to in-person clinic visits (156.9 minutes) (P = 0.007, Fig. 1). Also no differences were seen in patient satisfaction.

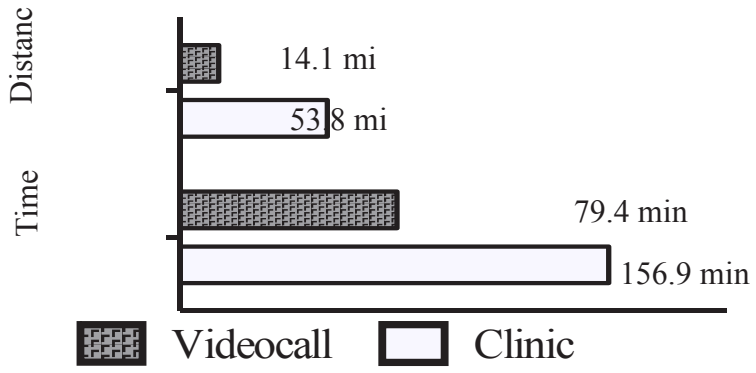
Conclusion: This study was the first of its kind to illustrate telemedicine as an alternative to in-person clinic visits in the orthopaedic trauma population based on similar patient satisfaction, reduced time away from work, and reduced travel distance and time for visits with equivalent patient satisfaction in their medical care. TM may be used to decrease barriers to follow-up. Further study with a larger patient population is warranted.

Table 1: C vs. TM groups

	C (n=9)	TM (n=8)	p
Overall satisfaction	4.56*	4.25*	0.74
Understood treatment	4.56*	4.50*	0.89
Took time off work	5/9 (56%)	0/9 (0%)	0.03
Complication rates	1/9 (11%)	1/8 (13%)	0.99

*Avg. response where 5 = very satisfied, 4 = satisfied, etc.

Figure 1: TM group analysis



See pages 47 - 108 for financial disclosure information.