Is pre-hospital emergency telemedicine implementation feasible in non-traditional EMS settings: A systematic literature review

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Introduction

The rate of technology expansion is rapidly covering even the most remote parts of the globe and in the lowest resource settings. With globalization however, low and middle income areas are facing emerging health issues such as injuries and chronic medical conditions. With these illnesses, there are inevitable demands on emergency services. It has been thought that technology be utilized to augment emergency medical care in such settings where formal Emergency Medical Services. To aggregate and analyze the existing literature on the topic a systematic literature review was conducted.

Methods

A systematic literature review was undertaken to explore the utilization of technology in the prehospital emergency setting without formal EMS systems. This is of significant importance at this point because of globalization and increased access to technology. Standard systematic literature review protocols were followed to include and exclude articles based on predetermined criteria. There were 21 articles selected from 1782 articles screened for full review. 15 articles were selected for the analysis. Most articles selected were of medium to low quality mostly due to the lack of statistical analysis and/or control groups being included. The measures recorded by articles included in the study can be grouped into one of five groups, with the majority reviewing "response times." The major findings showed that while telemedicine is feasible in prehospital settings without formal EMS services, there are no improvements in health outcomes. Further studies, specifically with statistical analysis and in the clinical area are required.

Results

The majority of the studies in the review did not have statistical analysis, thus this review could not conduct meta-analysis or group the results from the studies. The review would be more meaningful if it could provide statistical reference to support the findings of value from prehospital telemedicine in informal EMS settings.

• The review was conducted by only one reviewer; thus not allowing for disagreement and a more robust screening methodology.

• Studies were limited to only English, French, and Spanish thus potentially not including studies which would have otherwise qualified.

Discussion and Conclusions

• The use of telemedicine and mHealth in the prehospital setting is feasible. Though studies were often carried out in more controlled settings than the field.

• Studies measuring the quality of the intervention did have non-inferior or improved measures in the groups that used a form of telemedicine.

• When applied to a field clinical setting, there were no discernable mortality or patient health outcome differences. Theoretically, with increased bystander CPR rates and faster response times reported in these studies, the survival of OHCA should improve as more patients are getting more rapid CPR.

The nature of this topic makes studying it difficult because of the differing natural speeds of research and technology. Another challenge of research in this topic is that technology and connectivity vary greatly across different settings; thus it would be difficult to generalize results regarding feasibility between regions with differing technological capabilities. One of the major gaps in many of the studies reviewed was the general lack of statistical analysis. The other major area of improvement in this topic of research would have been the application of these interventions in a field setting. In conclusion, technology in the prehospital emergency medicine setting is a young field of study that may have significant hurdles in application. The studies conducted have shown promise in the use of technology in prehospital settings without formal EMS services, but are not robust enough to make strong conclusions or recommendations that could be put into practice. With more robust studies, we can hope to integrate new technologies into practice and better serve the populations without adequate EMS coverage to provide better and more timely emergency care.