Architectural design for remote patient monitoring system implementation in haematology units: a proposed model

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Abstract

Information and communication technology (ICT) has been pivotal in healthcare. In particular, wireless communication and wearable sensors technology have garnered more attention in healthcare. They allow for real-time healthcare monitoring systems, early diagnosis, and timely treatment, which can significantly reduce unnecessary loss of lives primarily due to delays of response healthcare providers, Furthermore, low healthcare professionals-to-patient ratios.

This study proposes a framework of remote patient monitoring (RPM) for managing haemophilic children in Egypt. This program is designed for health data management inside the Regional Blood Transfusion Center (RBTC) at the Therapeutic Unit in Alexandria. Meanwhile, it employs a descriptive-analytical method to investigate the impact of Wireless Body Sensor Networks (WBSN) on the timely collection of physical health data. Moreover, this study outlines a planning strategy for integrating Wireless Body Area Network (WBAN) technology into telemonitoring systems, emphasizing its applications within healthcare, particularly in haematology.

The results of this study indicate the effectiveness of RPM in improving patient experience, and medication compliance, and reducing hospital readmissions. RPM monitors wirelessly patients' physiological parameters in real-time transmitting data to the Electronic Medical Record (EMR) in real-time, and alerting healthcare providers when abnormal readings are detected. The study concludes that home therapy can

lead to prompt and optimal treatment, thereby reducing pain, dysfunction, and long-term disability for patients.

Conclusion

Technological innovation in health information systems has transformed healthcare applications by introducing telemedicine services, personalized healthcare, Electronic Health Records (EHRs), and remote patient monitoring. These advancements have improving health data management and enhanced patient engagement, ultimately leading to improved health outcomes and a more responsive healthcare system. This paper tried to introduce telemonitoring system for haemophilic patient which built on three layers. The first layer is concerned with data acquisition, it is used to gather data using wearable devices. Patients' measurements are transmitted to the second layer using various transmission protocols. The second layer consists of cloud and web servers that receive, process, and store date. The third layer is the presentation layer that develop dashboard for display the collected data in a visually appealing.

In conclusion, this program highlights the potential for enhancing healthcare through advanced digital tools, particularly with remote patient monitoring. However, challenges remain in the implementation process. Future efforts should address these critical factors affecting technology adoption and develop strategies to mitigate them before launching technology implementation initiatives.