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Short Communication

Using smartphone applications to target poor cardiac medication adherence

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Abstract

Statement of the Problem: The ORBITA trial has shown that severe coronary stenosis patients undergoing percutaneous coronary intervention did not show a significant difference in symptom relief.Thus, focus is shifting to medication for long-term symptomatic relief, primarily aspirin, statins, clopidogrel, anti-anginal and anti-hypertensives [2]. Current research [3, 4] shows that approximately 50% of patients with cardiovascular disease have poor adherence to their medications, costing the NHS £300 million annually.Our aim was therefore to develop an innovative method to increase patient's adherence to their cardiovascular medication.

Methodology: Research was carried out into the main barriers to taking medications, and these were identified as forgetfulness; misinformation on the drug's side effects and lack of motivation to take medication due to perspectives on efficacy of medication. An initial survey on patients showed that 96% of respondents used a smartphone regularly, enforcing our decision to create an app. Microsoft PowerPoint was used to create the prototype with sections oninformation on drugs they were taking, an interactive quiz, a calendar selection and a rewards section. Initial patient opinion was then gauged at a focus group of patients participating in the ORBITA trial (n=10) and based on constructive feedback given, improvements were made. The app was then tested on the cardiac ward at Hammersmith hospital where patients (n=14) filled in questionnaires on various adherence parameters before and after using the app. Data was then analysed using Mann-Whitney-U tests and compared.

The app prototype: The app contains 4 main sections which aim to increase drug adherence. The drug information section gives concise overviews of the major classes of cardiovascular medications with information on coping with side effects. The quiz section tests uses drug-specific questions that highlight the efficacy and the low frequency of the side effects of each medication. The calendar section outlines the user's drug regimen with push notifications for reminders to take medications. Tick boxes are used to monitor adherence and can be cashed in for rewards. The piggybank section then allows users to cash in coins collected for rewards.

Results: The app enabled certain barriers to adherence to be overcome with patients showing a significant decrease in concern over perceived side effects ($p<0.001$), and a significant improvement in understanding of prescribed medication ($p<0.01$). 83% of patients said the app would help them to remember to take their medication

Conclusion Significance: As importance is shifting away from invasive procedures to pharmacological therapy in these patients, more needs to be done to ensure better drug adherence to increase both patient's medical well-being, and cost-effectiveness in reducing medical waste. Smartphone applications, such as the protype developed, offer a new innovative way for patients to engage and be proactive with their healthcare.They enable patients to have a greater understanding of their conditions and the medications they are taking, ultimately increase patient adherence.

Biography

Sharan is a current third year medical students at Imperial College London. He is interested in teaching and research, particularly in the fields of public health, with a focus on cardiovascular disease and diabetes. He was previously won the Corpus Christi Essay Prize, investigating the effects of antibiotic resistance on primary care. He has also recently carried out research on the use of interactive focus groups in the management of diabetes within primary care, and was invited to present this at the European Endocrinology Conference in London. Sharan has a keen interest in Cardiology, and was on the organising committee of the 7th National Cardiology and Cardiothoracic conference, run by Imperial College Heart Society and BUCA. He also acted as a conference maker for the GIANT health annual conference, Europe's largest health-tech conference. He hopes to develop new methods to target public health problems within the community setting, as he has done in developing this app prototype to increase medication adherence within cardiovascular patients.

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