A systematic and integrated review of mobile-based technology to promote active lifestyles in people with Type 2 Diabetes

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Introduction

• Substantial benefits of leading an active lifestyle following a diagnosis of Type 2 Diabetes have been reported, including improved glycaemic control. Reduced sedentary time has been shown to be effective in the management of blood glucose levels in non-diabetic adults irrespective of physical activity levels.
• Technology offers a method of delivering interventions on a much larger scale and could have a significant impact on management of the current diabetes epidemic.
• Studies examining the use of mobile-based technologies to promote an active lifestyle have not previously been reviewed.

Aims

To review studies examining the effectiveness, acceptability and feasibility of mobile-based technology for promoting active lifestyles in people with Type 2 Diabetes.

Methods

• An integrated review was conducted using a modified methodological framework developed by Whittemore and Knaff (2005).
• Electronic databases (PubMed, Medline, ScienceDirect and ACM Digital Library) were searched for papers up to October 2015
• The inclusion criteria included:
  • **Participant**: Participants with Type 2 Diabetes.
  • **Intervention**: Promotion of an active lifestyle using smartphone apps and wearable technology for Type 2 Diabetes management.
  • **Comparison**: Any comparison.
  • **Outcome**: Feasibility, acceptability or effectiveness of technology
  • **Study Design**: Both empirical and theoretical research published in English from peer reviewed journals and conference papers.
• Data were extracted and quality was assessed using an adapted quality assessment tool.
• Studies were categorised as:
  • 1)informing, 2)monitoring, 3)provoking or 4)sustaining behaviour.

Results

• Figure 1 illustrates the search and exclusion process.
• Nine papers were identified as suitable for review.
  • Five studies used Smartphone or tablet apps, one used a Diabetes PDA, one used a combination of continuous glucose monitor and accelerometer, one used a pedometer and one used a website delivered by a Smartphone.
  • Six studies examined effectiveness, three examined feasibility, the acceptability of technology was examined in four studies and three studies examined a combination.
  • Five papers focused on the effectiveness of using mobile-based technology to inform, provoke and sustain lifestyle change.
  • Three papers examined the feasibility of technology used to inform, monitor and provoke lifestyle change.
  • Four focused on the acceptability of mobile-based technology on informing, monitoring and provoking lifestyle change.
  • No papers examined the effectiveness of mobile-based technology in monitoring health behaviours and behaviour change.
• The feasibility and acceptability of using mobile-based technology to provide sustained lifestyle change has not been investigated.
• Four of the studies found mobile-based technology to be motivational and supportive for behaviour change.

Discussion and Conclusions

• The visual reinforcement of the importance of being physically active for good glucose management was identified as motivational.
• None of the studies examined all three of the outcomes.
• None of the studies focused solely on decreasing the participants’ sedentary behaviour.
• Limited research has examined the feasibility, acceptability and effectiveness of mobile-based technology to promote active lifestyles and subsequently good diabetes management in people with Type 2 Diabetes.

Recommendations

• Consider using mobile-based technology that can be tailored to the individual.
• Future interventions should be informed by research that has examined all three variables to identify the most effective, feasible and acceptable mobile-technology methods in promoting sustained active lifestyles in those with Type 2 Diabetes.

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