

A pilot study to investigate the feasibility and acceptability of Telehealth in preventing hypoglycaemia for Type 2 diabetic patients

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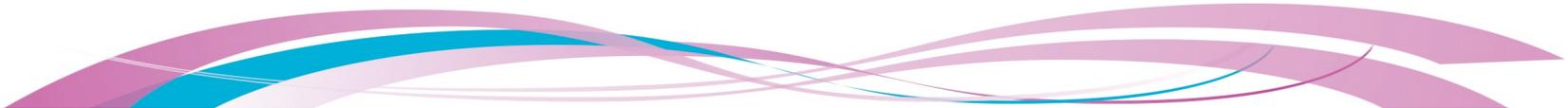


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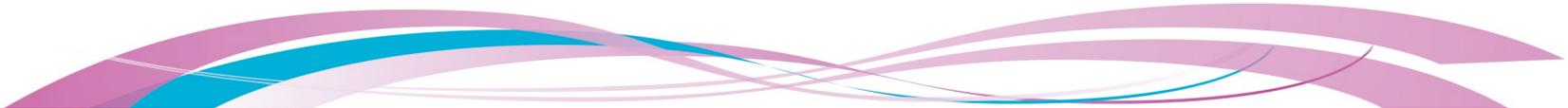
Hypoglycaemia

- The Joint British Diabetes Societies for Inpatient Care estimated that every year between 70,000 to 100,000 emergency ambulance call-outs occur due to hypoglycaemia in the UK.
- In 2011-2012, there were 11,759 admissions in the UK due to hypoglycaemia taking up 45502 bed days.
- In Yorkshire and Humber, >5000 ambulance call-outs due to severe hypoglycaemia in 2012.
- Accounting for the cost of urgent treatment given by the ambulance crew, accident and emergency department and follow up care, the estimated annual cost was **£13.6 million** in England.



Hypoglycaemia

- Strong association between severe hypoglycaemia and cardiovascular disease in patients with type 2 diabetes
- For patients who self reported having severe hypoglycaemia, their mortality rate was 3.4 times higher
- More seriously, a number of observational studies have identified the link between severe hypoglycaemia and cancer and premature death



Telehealth studies

A number of telehealth studies have shown positive results in self-care engagement, diabetes control and understanding of diabetes. Other additional benefits such as BMI, cholesterol, improved capture of hypo or hyperglycaemia episodes were also observed.

However, little evidence exists at present on using remote monitoring in conjunction with a real time feedback system to prevent hypoglycaemia. In fact, no study has ever been done to explore this idea for Type 2 diabetic patients.

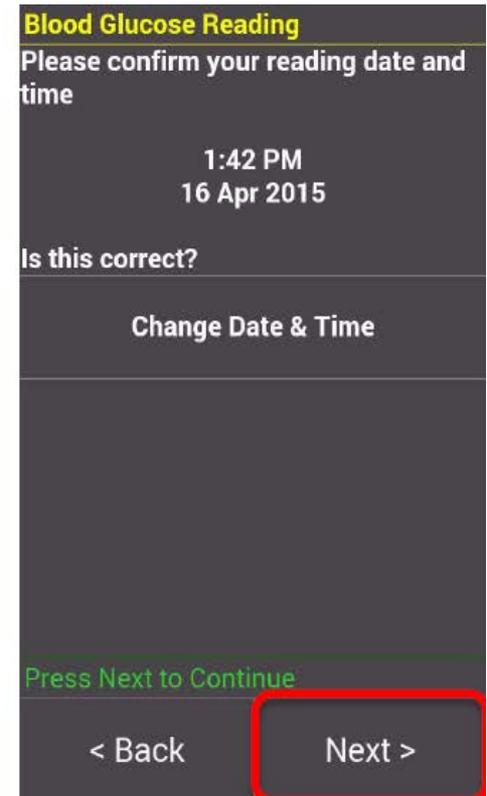
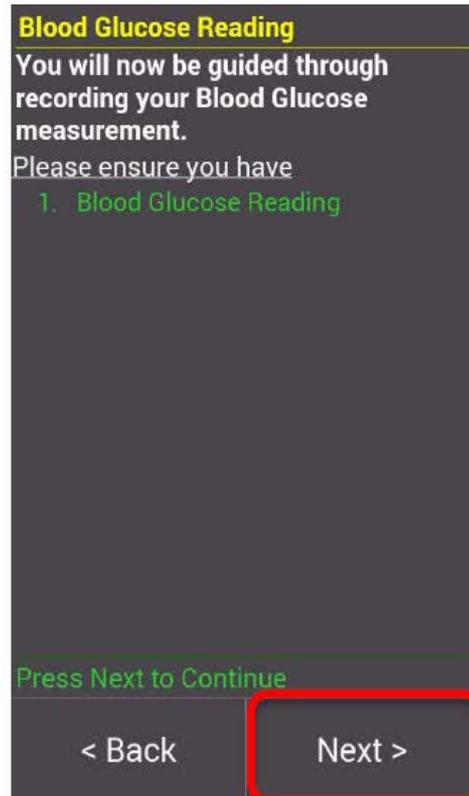
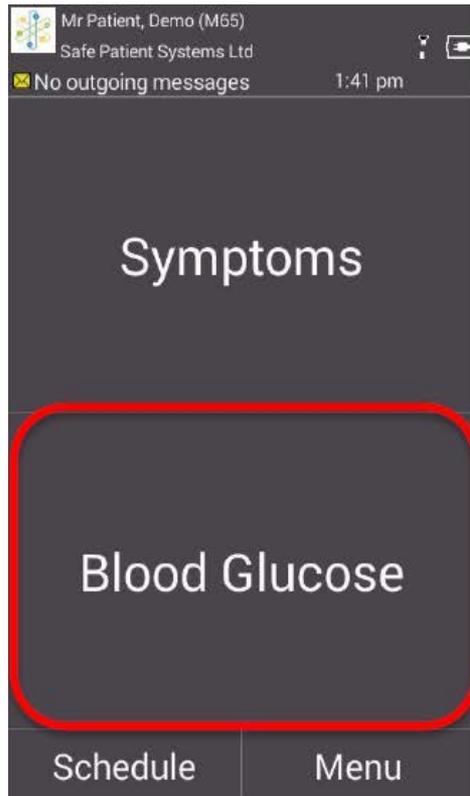


Aims of the Study:

- Investigate the feasibility and acceptability of telehealth support to prevent severe hypoglycaemia
- Explore views of stakeholders on remote monitoring
- Explore the impact of remote monitoring and proactive management on patients' awareness of hypoglycaemia, their satisfaction of their diabetes care
- Identify any potential risks of remote monitoring of blood glucose



Intervention



Intervention

Blood Glucose Reading

Select Category

Before	After
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Select Time of Day

Breakfast	Lunch
Tea	Bed
Unscheduled	

Press Next to Continue

< Back **Next >**

Enter Blood Glucose (mmol/L)

8.3 mmol/L

1	2	3
4	5	6
7	8	9
0	.	DEL

Press Next to Continue

< Back **Next >**

Reading Complete

Your readings are now ready to upload.

Blood Glucose

8.3 mmol/L

Taken 1:42PM 16-Apr-2015

Press Next to Continue

< Back **Next >**



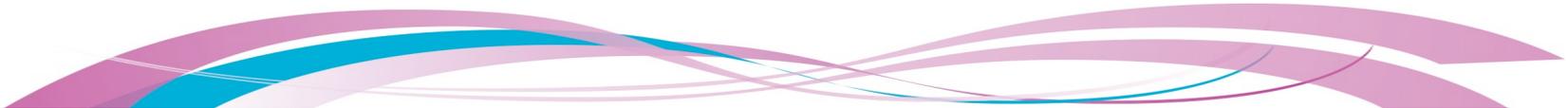
Intervention

Advice

 Your blood sugar is in the normal range. However if you continue to feel unwell you should contact your GP or 111 for advice.

Press Done to Upload

Done



Intervention

Reading Low!

The reading you have entered is too low. You will now be asked to complete a short questionnaire regarding symptoms you may be suffering.

Press Next to Continue

< Back **Next >**

Select Your Symptoms

Blurring

Sweating

Hunger

Butterflies in stomach

Tingling around mouth

Light headaches

None

Press Next to Continue

< Back **Next >**

Advice

Your blood sugar is quite low. Please take the emergency treatment now. Immediate Treatment Options

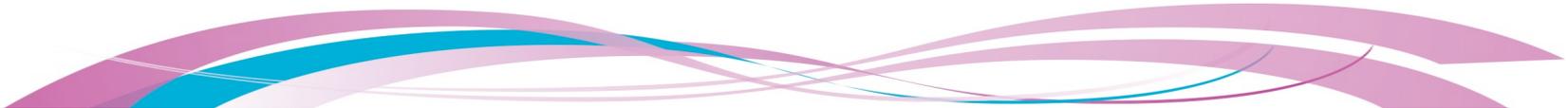
100ml of Lucozade or 150ml (a small can) of non-diet fizzy drink or 200ml (a small carton) of orange juice or 5-6 dextrose tablets or 4 large Jelly babies or 7 large Jelly beans or 2 tubes of glucose gel

Press Done to Upload

Done



Intervention



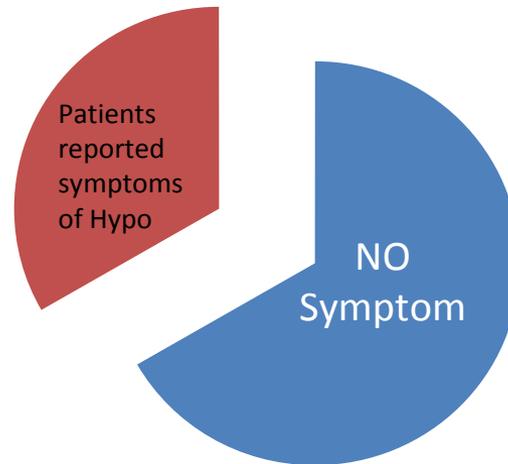
Results

- 13 patients completed the 12-week pilot study.
- All the patients managed to follow the treatment advice on the mobile devices and treated their low blood glucose successfully.
- There was no hypoglycaemia related ambulance call out nor any contact with emergency GP or out of hour services during the study period.



Results

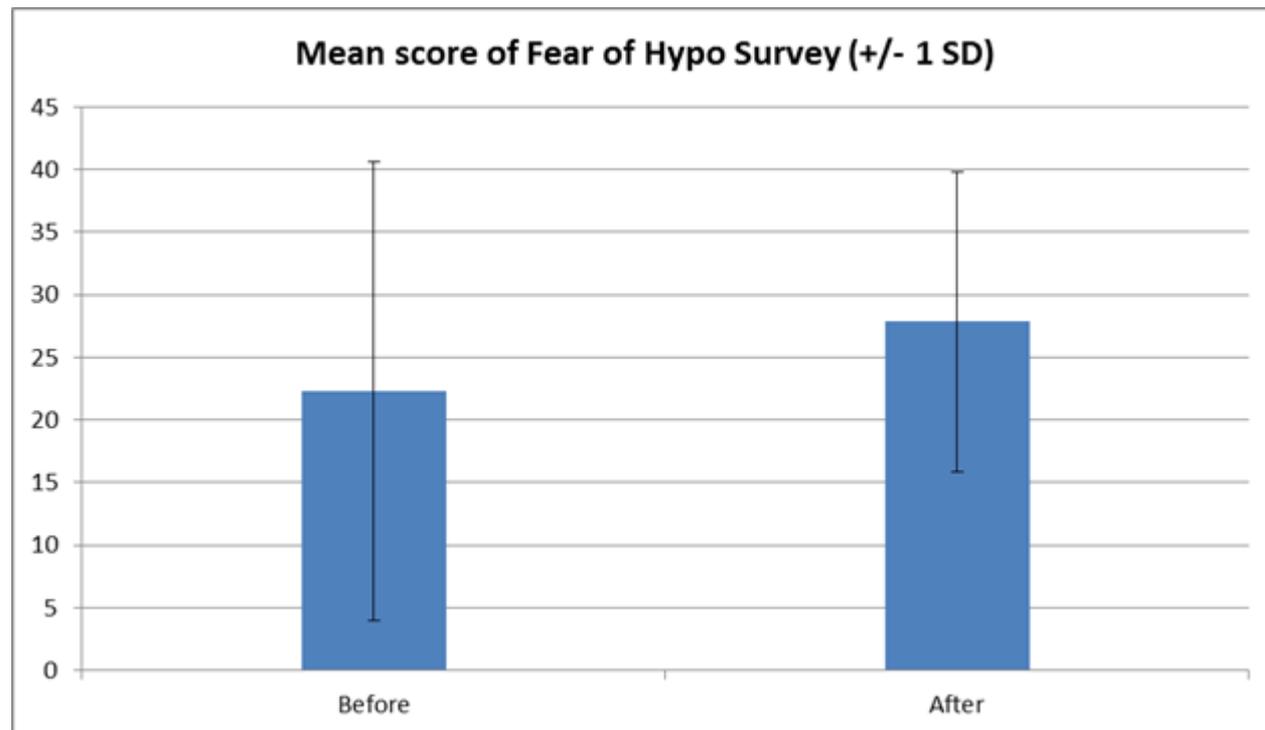
- **27 episodes of hypoglycaemia alerts but only 9 of them when patient reported associated symptoms. The vast majority of the hypoglycaemia alerts (89%) were generated by 3 patients.**



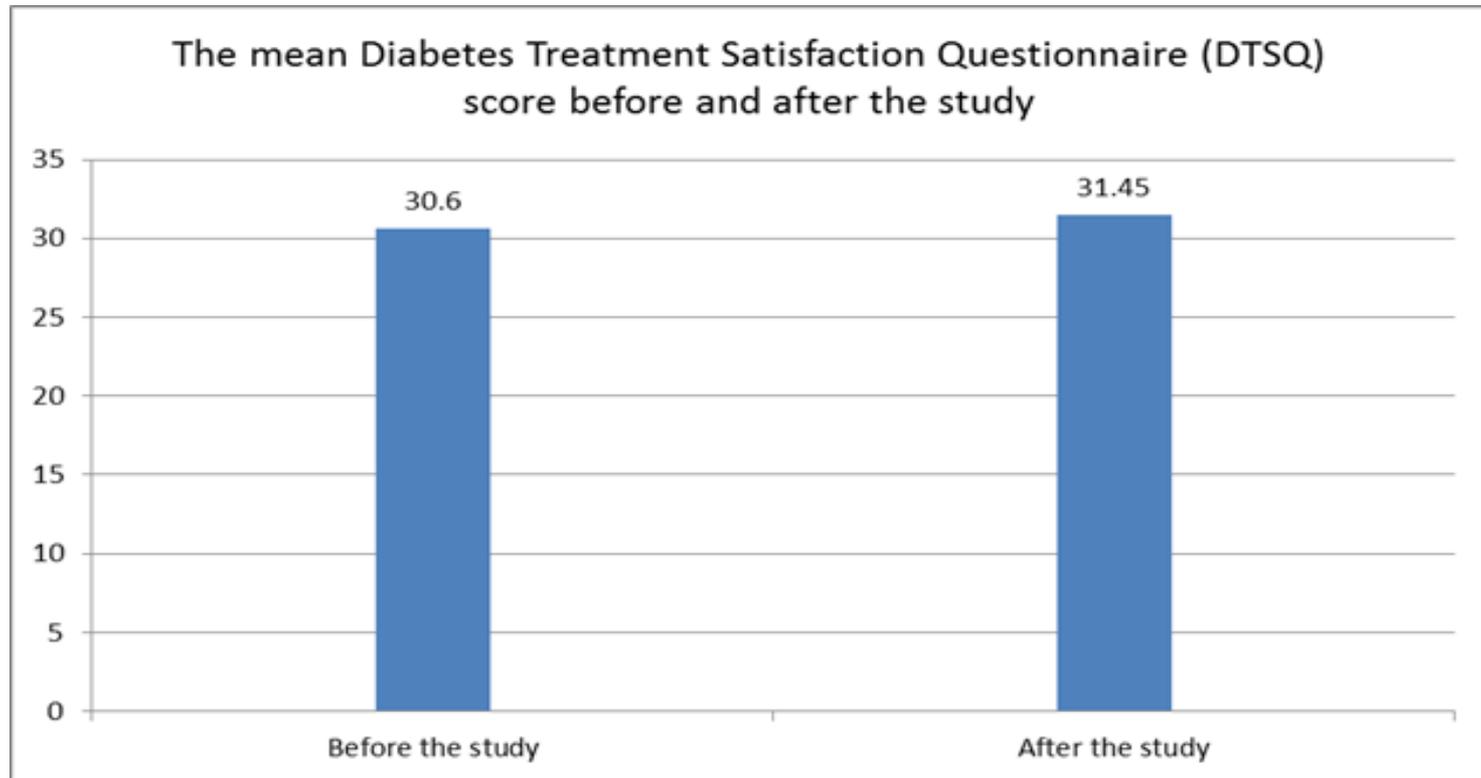
- **Out of the 6 patients who reported hypoglycaemia, 3 patients had no previously documented hypoglycaemia episodes recorded in their medical record.**

Results

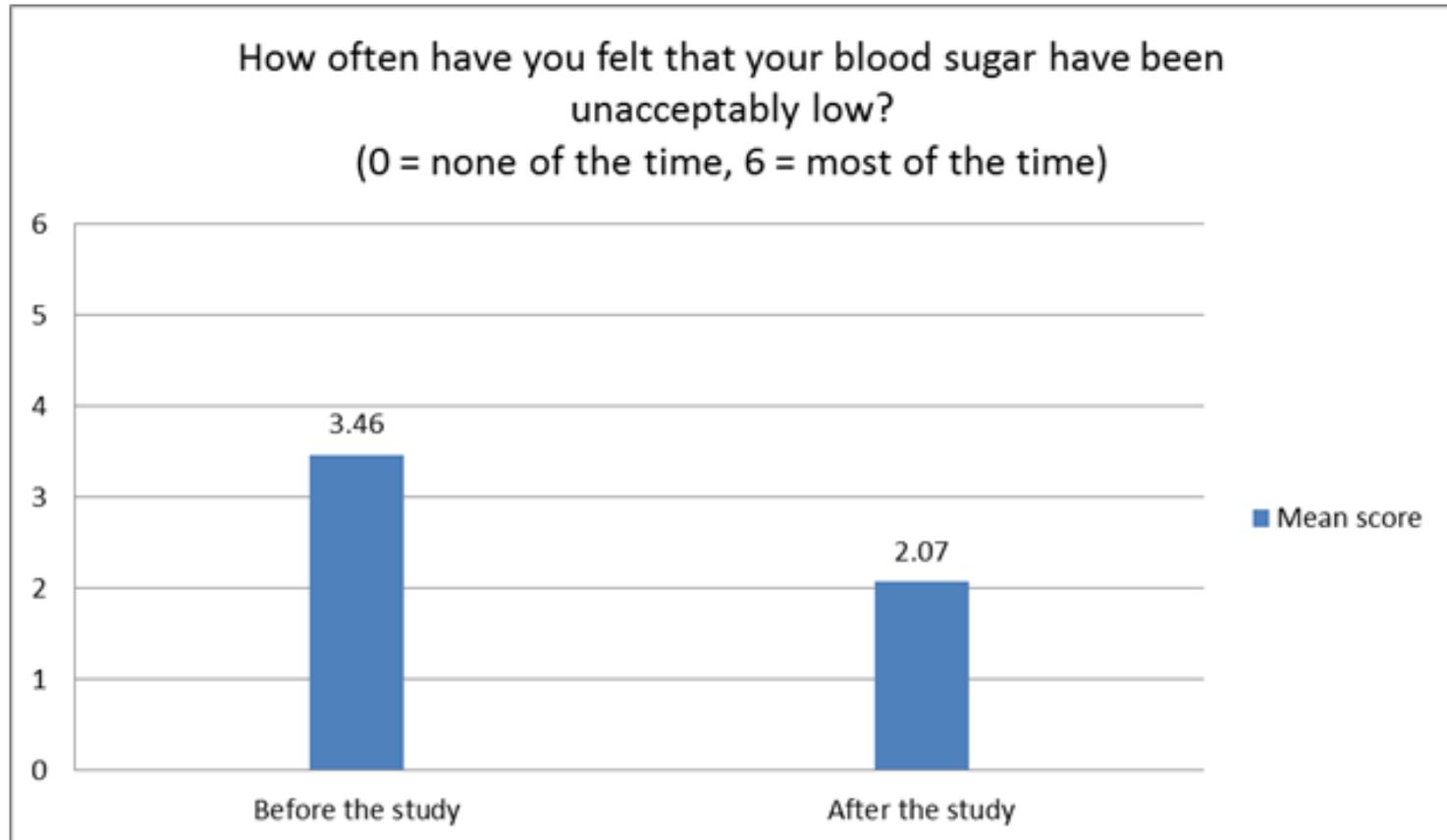
- The mean score of the Fear of Hypo Survey from all participants was higher after the study. In other words, the level of fear of hypoglycaemia increased after the study.



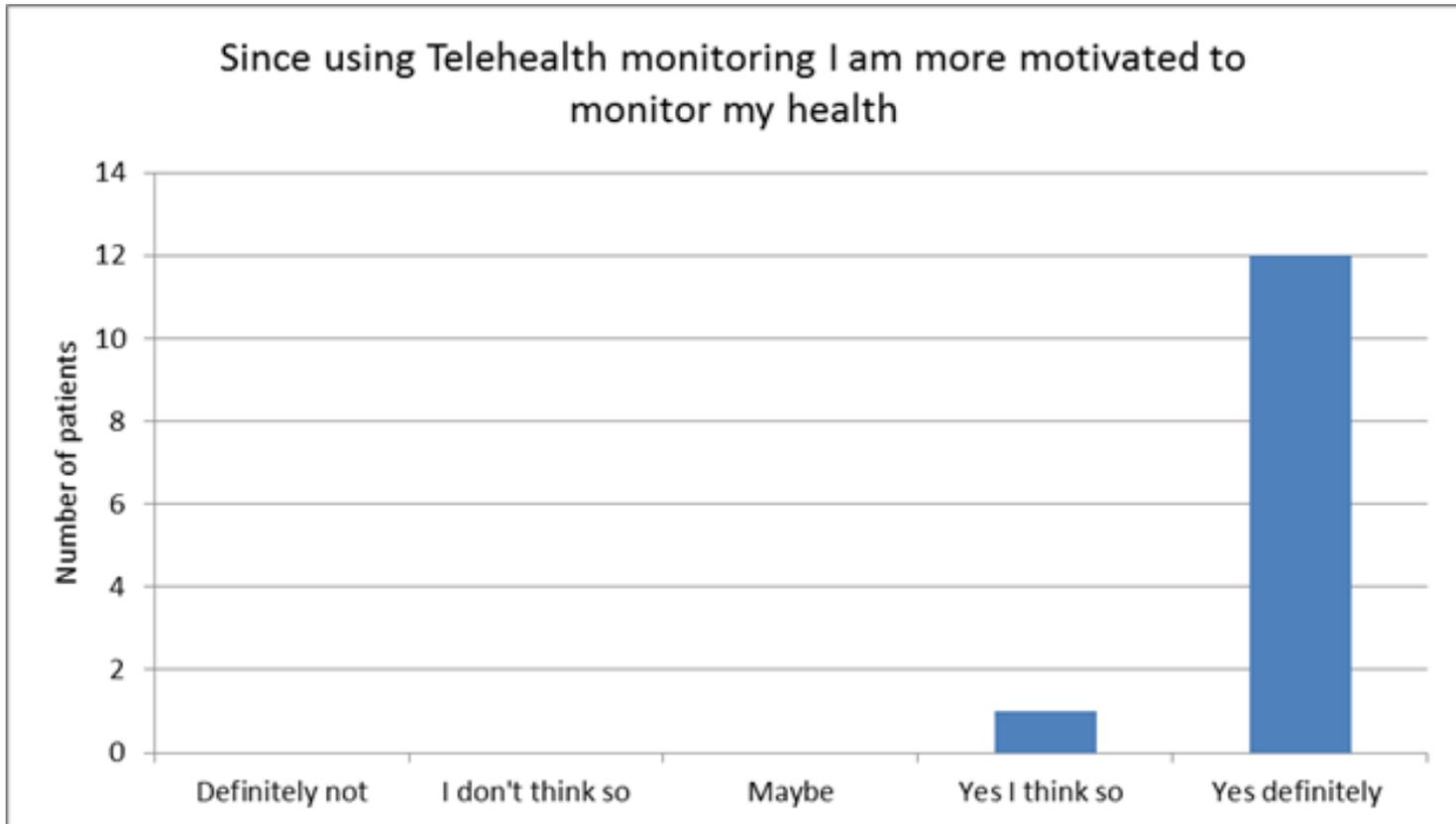
Diabetes Treatment Satisfaction Questionnaire (DTSQs) results



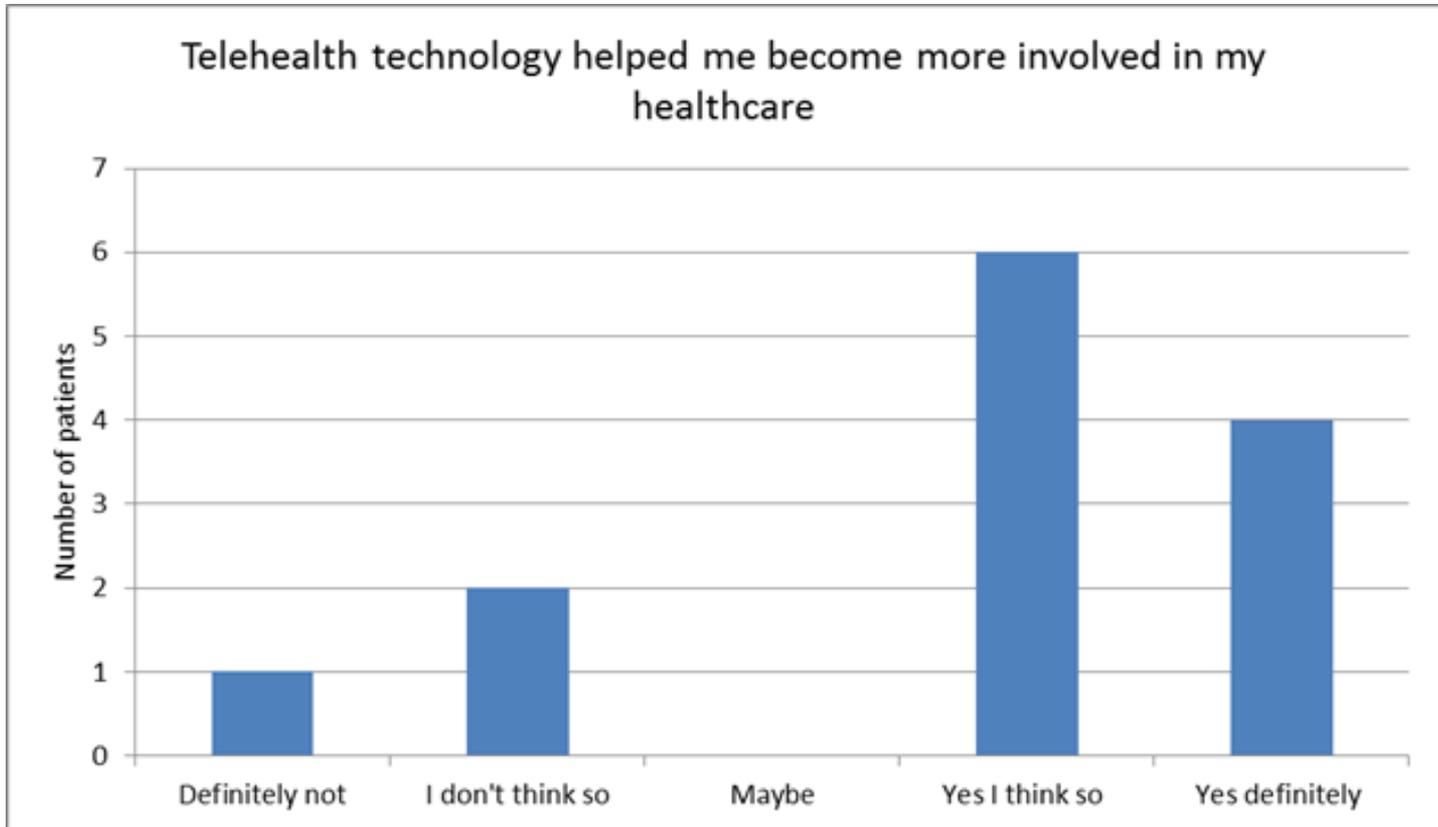
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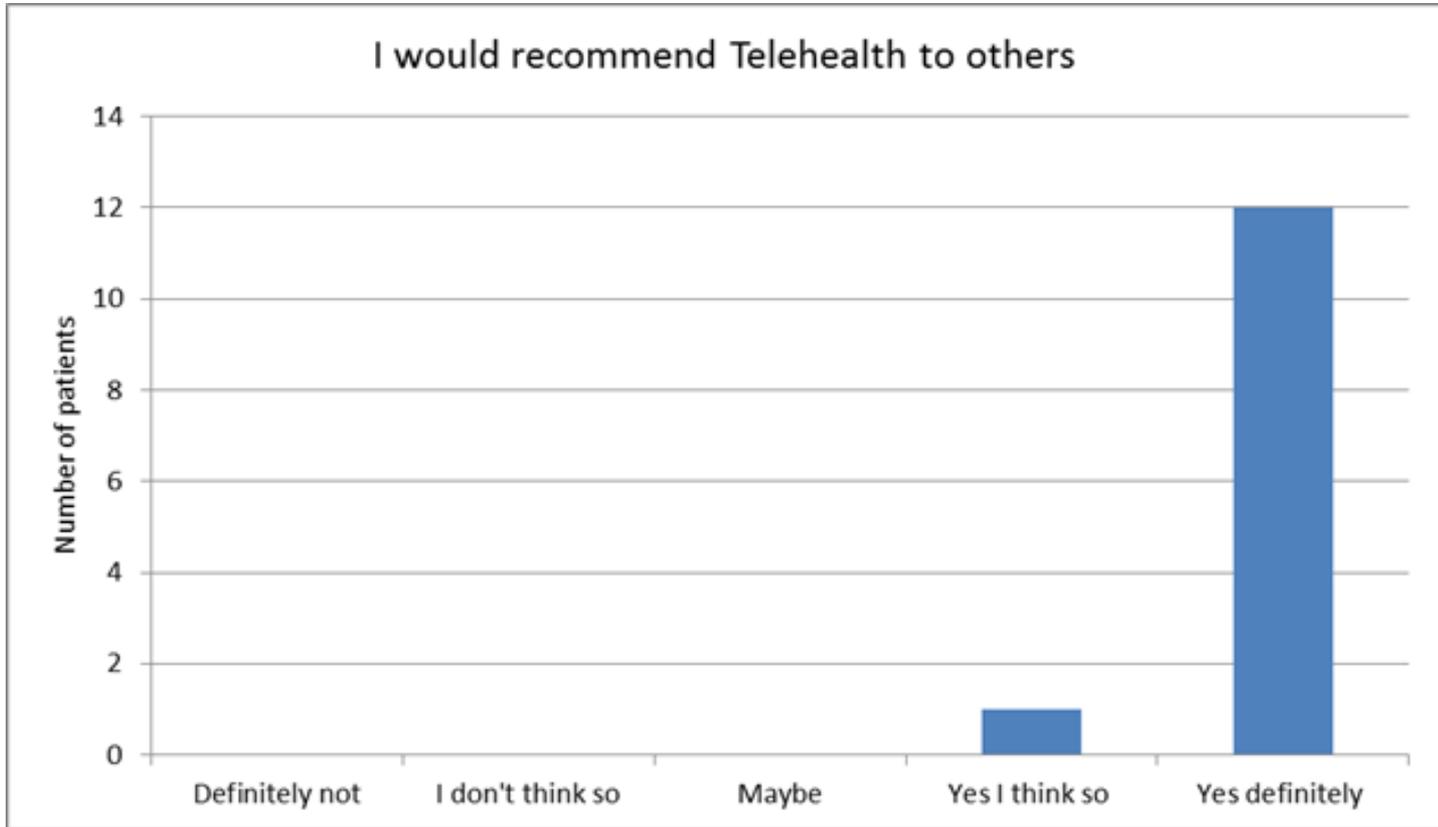
Telehealth Satisfaction Survey



Telehealth Satisfaction Survey



Telehealth Satisfaction Survey



Patient feedback

What did you like the most about Telehealth? I knew that someone was monitoring my readings and if there was a problem a nurse always phoned to find out if I was ok.

What did you like least about Telehealth? Monitoring blood sugars 4 times a day. (Fingers became sore)

What did you like the most about Telehealth? Giving patient reassurance about their diabetes (Hypo)

What did you like least about Telehealth? Nothing really.

What did you like the most about Telehealth? IT IS GOOD HELPS ME CONTROL MY PROBLEM

What did you like least about Telehealth? Very Good

Qualitative feedback from patients and carers

- The telehealth equipment was easy to use
- Increased their awareness of hypoglycaemia and its associated symptoms.
- Increased confidence in dealing with minor hypoglycaemia episodes.
- Reduced number of emergency contact with GPs or out of hours services
- Positive behaviour change was reported. One patient reported he is now taking snacks and sweets with him when he goes out shopping in the morning when hypoglycaemia during the trial period.
- Reduction in Diabetes medication for one patient
- A good educational tool for both patients and carers



Qualitative feedback from patients and carers

- All patients recommended the service and especially mentioned newly diagnosed diabetics or patients starting on new medications
- Better understanding of time to take their medications
- It provided peace of mind to carers and patients especially during Ramadan when patients fasted long hours during day time
- More positive attitude towards their condition.
- Taking more personal responsibility for their condition.
- Less uncertainty and guessing when they feel unwell



Conclusions

Hypoglycaemia is a common side effect of diabetes treatment but the awareness is low

Urgent treatment for hypoglycaemia is expensive but can be reduced by proactive management of glucose levels

The telehealth service was very well received by the patients and carers in this pilot study

Given the positive feedback and results without any adverse clinical events, and as the study was delivered within the scheduled time and budget, it can be concluded that this pilot study is feasible and safe to be scaled up for a larger trial.



Further Studies

Further studies are needed to investigate whether this remote monitoring is suitable for high risk diabetic patients, and to identify the most cost effective frequency for monitoring blood glucose for different patients based on their risks.

Future studies should take into the account the role of predictive data analysis in preventing severe hypoglycaemia. The combination of a personalised telehealth service and predictive data analysis would provide an innovative solution to transform the management of many chronic diseases.



Improving Diabetes Care

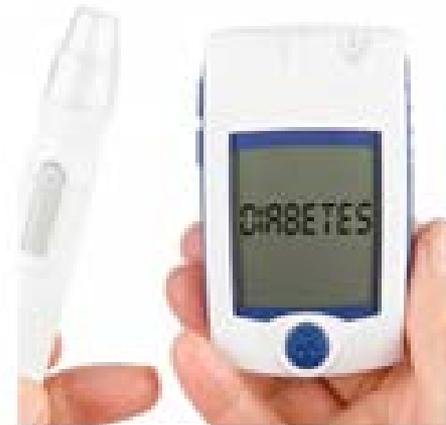
Too many people are suffering from hypoglycaemia when they needn't be because their treatment and self care could be improved.

This project aims to address this issue by implementing a locally developed set of tools to support general practice and community pharmacy to foster greater self care, health literacy and activation of patients with diabetes.

- Prevent severe hypoglycaemia episodes in diabetes.
- Increase health literacy and/or activation (2) of patients to "do something" about avoiding episodes of hypoglycaemia (if any severe).

This will include recognising hypoglycaemia and its causes, inclusion of the management of hypoglycaemia in personal self-care plan, taking the correct steps to manage hypoglycaemia if it occurs, the importance of maintaining good glycaemic control.

Programme Outcomes



Thank you

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