

THE UNIVERSITY *of York*

The Department of Health Sciences

Exploring the feasibility and usefulness of collecting data on daily IBS symptom severity using text messaging



- **Feasibility**

- Is this an effective way to collect data?
- Is there a difference in response rate between morning and evening?

- **Usefulness**

- Do the scores correlate with the questionnaire measures
  - particularly SSS and EQ5D?
- Does the time of day make a difference?

# Why?

- Daily symptom information is useful for research into and management of chronic illness
- SMS text messaging has been shown to be a popular alternative to diaries in the management of asthma and diabetes, with lower attrition rates
- Little research into it as a tool for data collection
- Text messaging is simple, fast, inexpensive and widely available
- If it is feasible and produces useful data it could be a useful alternative or adjunct to questionnaires.
- SMS most widely-used mobile data service on earth – 1 billion messages sent over China's networks on 9<sup>th</sup> Feb 2005

# Uses in healthcare

- Behaviour change – weight loss, smoking cessation programmes – positive effects in the short term
- Adherence – physical activity programmes, diabetes care programmes, anti-retroviral medication
- Chronic illness management – current studies looking at depression, bi-polar disorder and schizophrenia.
- Attendance at clinics, outpatients appointments, probation services.

# Studies looking at feasibility

- Bexelius et al, 2009 Population survey data
- Roberts and Gorman, 2009 Post-operative pain scores collected by outpatients services
- Johansen and Wedderkorp, 2010 back pain scores and days off work collected weekly for 53 weeks.
- Anhoj et al, 2004 Asthma management
- Kuntsche and Robert, 2009 Alcohol consumption

- Pain scores
- Population survey data
- Mood scores
- Bothersomeness
- Sick leave days
- Alcohol consumption

# Method

- Participants from trial of acupuncture vs usual care for IBS were invited to receive SMS text message for two seven-day periods
- Randomised to receive text messages at 9.30am or 6.30pm
- Message: “On a scale of 0 - 9, with 9 being the worst symptoms you could have, what are your IBS symptoms now? Please text back a single number”

# Results - feasibility

- 54 participants were each sent a message a day for seven consecutive days, a total of 378 messages. 342 responses were received.
- 47 participants received and replied to seven messages, two were sent seven messages and replied six times each.
- Messages were sent to, and failed to reach, three participants.
- 48.5% of the messages were answered < 15 minutes from the time of sending, 73.4% within one hour and 97% within 10 hours.
- Afternoon messages were answered more quickly.



## Baseline characteristics of main trial and substudy populations by treatment allocation group

	Acupuncture (n=116)	Substudy acupuncture (n=34)	Usual care (n=117)	Substudy usual care (n=20)	Total (n=233)	Substudy total (n=54)
Age						
Mean (SD)	44.28 (14.31)	43.82 (12.46)	42.68 (14.79)	42.23 (13.86)	43.47 (14.54)	43.23 (12.89)
Median (min to max)	43.81 (21.33 to 78.29)	43.47 (21.33 - 67.41)	42.00 (19.51 to 74.47)	43.16 (25.65 – 74.09)	42.69 (19.51 to 78.29)	43.38 (21.33 to 74.09)
Sex						
Male (%)	21 (18.10%)	7 (20.6%)	24 (20.51%)	3 (15.05%)	45 (19.31%)	10 (18.5%)
Baseline mean SSS scores	280.00 (81.34) (n=115)	289.24 (76.86)	277.17 (71.50) (n=113)	290.25 (62.78)	278.60 (76.47)	289.61 (71.36)

# Who responded?

- 47 of 54 ppts replied to all seven messages
- Two missed one day
- One lost phone
- Two participants who had not returned paper questionnaires responded to the text messages

	Symptom Severity Score m9		SMS score	
	Kendal's tau b	p	Kendal's tau b	p
HADS Anxiety month 9	0.145	0.13	0.217	0.03
HADS Depression month 9	0.254	0.01	0.339	0.001
EQ5D month 9	-0.207	0.04	-0.321	0.002
SF12 MCS month 9	-0.220	0.02	-0.339	0.001
SF12 PCS month 9	-0.194	0.04	-0.134	0.18

# Correlations of nine-month SMS scores with components of the Symptom Severity Score at nine months

How severe is your tummy pain?	Correlation Coefficient	.335**
	Sig. (2-tailed)	.001
	N	46
No if days with abdominal pain out of every 10	Correlation Coefficient	.390**
	Sig. (2-tailed)	.000
	N	47
How severe is your abdominal distension?	Correlation Coefficient	.264*
	Sig. (2-tailed)	.011
	N	46
How satisfied are you with your bowel habit?	Correlation Coefficient	.387**
	Sig. (2-tailed)	.000
	N	49
How much is IBS interfering with your life in general?	Correlation Coefficient	.484**
	Sig. (2-tailed)	.000
	N	49

# Summary of results

- 48.5% of the messages were answered < 15 minutes from the time of sending, 73.4% within one hour and 97% within 10 hours. Afternoon messages were answered more quickly.
- Mean scores correlate significantly with IBS trial main outcome measure, Symptom Severity Score, Kendal's tau  $b = .5$  ( $p < 0.005$ )
- SMS scores correlate significantly with each domain of the symptom severity score (SSS), most highly with interference with daily life - Kendal's tau = .484  $p > 0.005$  and with EQ5D, SF12 MCS and HADS depression scores at month 9
- Two participants responded to text messages but did not return questionnaires. Missing outcome data could be derived from SMS score.

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