Research paper

Development of audio methods of data collection in Bangladesh

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What is known on this subject
- Previous research has demonstrated difficulties in data collection in populations with low literacy levels.
- Non-literate individuals are often excluded from research, although the use of certain methods can increase participation rates.
- Audio methods have been shown to be acceptable for data collection, for example in order to measure knowledge and self-care in individuals with type 2 diabetes.

What this paper adds
- Audio methods of data collection, previously developed in the UK for use with South Asians with type 2 diabetes and low literacy rates, were found to be acceptable in two populations in Bangladesh.
- Colour-shaded Likert-type scales were preferred to multiple choice questionnaires.
- Using audio methods of questionnaire delivery ensures confidentiality whilst at the same time encouraging individuals with low literacy levels to participate in research.

ABSTRACT

Cultural and communication difficulties resulting from the lack of a common language or understanding, and high levels of non-literacy are significant problems for diabetes self-management and related research among South Asians with type 2 diabetes. Previous research in the UK has encountered serious difficulties in implementing self-completed questionnaires among this group, but has also demonstrated the usefulness of alternative data collection methods. This study attempted further development of previously tested audio methods of questionnaire administration and data collection, in order to assess their usefulness among individuals with type 2 diabetes living in Bangladesh.

A total of 50 individuals, who spoke Sylheti and were attending the diabetes outpatient department of two different hospitals (one urban and one sub-urban) in Bangladesh, were recruited. All of them had type 2 diabetes. The audio questionnaires were tested and each participant's opinions with regard to the administration and completion of audio-assisted methods was evaluated.

Overall, the study participants did not report any difficulties in understanding and completing the audio-recorded questionnaires. However, participants reported finding the self-efficacy questionnaire easier to understand and complete compared to the knowledge questionnaire.

This study evaluated the potential and usefulness of administering self-completed audio questionnaires to populations where literacy levels are low, in order to establish levels of knowledge and self-efficacy for diabetes self-care. The use of audio methods of data collection was seen as a completely acceptable alternative approach.

Keywords: instrument development, qualitative methods, South Asian, type 2 diabetes

Introduction

Type 2 diabetes is a significant health problem in South Asians, both in the UK and in countries such as Bangladesh, India and Pakistan (Hussain *et al*, 2005). In the UK, healthcare delivery as well as health services research in South Asian groups is often hampered by cultural and communication difficulties such as the lack of a common language or understanding (Collins and Johnson, 2007; Lloyd *et al*, 2006, 2008a,b). This is particularly evident with regard to services provided for diabetes, where recommended standards of care involve self-management of the condition, supported by diabetes education and other interventions delivered by a range of healthcare professionals (Department of Health, 2001). Communication problems may occur in both health service delivery and research, and in both settings the collection and interpretation of self-reported data may be problematic (Hunt and Bhopal, 2003, 2004). Individuals from minority ethnic groups are often excluded from research on the grounds of language or literacy difficulties, and so their views are often marginalised (Picker Institute, 2006; Lloyd *et al*, 2008c).

There has been increased interest in recent years in the experiences of migrants with regard to health services delivery in the UK. Research in this area has used a range of methods, although qualitative techniques have become more popular as a useful way of obtaining the views and opinions of migrant communities (Greenhalgh *et al*, 1998; Rhodes *et al*, 2003; Sunsoa, 2008). Increasing participation rates in *clinical* trials appears to remain a significant challenge (Hussain-Gambles *et al*, 2005). A recent large investigation of South Asians with diabetes attending primary and secondary care services in the UK (Bellary *et al*, 2008) clearly demonstrated some of these problems. Although recruitment *per se* was not particularly problematic, serious difficulties in implementing self-complete questionnaires were encountered, despite the availability of translated questionnaires (Lloyd *et al*, 2006). Given the high rates of non-literacy and the common reliance on relatives to respond to information requests on the patient's behalf, a follow-up study was designed to develop alternative data collection methods (Lloyd *et al*, 2008b,c). In this latter qualitative study, two groups of adults with type 2 diabetes, whose main language was only spoken and who did not have an agreed written form, participated in a series of focus groups during which both the content and form of delivery of two survey instruments designed to measure aspects of diabetes self-care were evaluated and adapted. The results of this research, where four alternative methods of data collection were compared, demonstrated that, for the Bengali study population, independent audio data collection was the preferred mode

(Lloyd *et al*, 2008b). This entailed the participants completing the questionnaires by listening to audio versions of the questionnaires and completing colour-coded answer sheets independently. All the Bengali participants preferred this method over and above using traditional paper and pencil methods or assisted data collection methods. In order to further test out this method, a small study was undertaken with individuals with type 2 diabetes living in two areas of Bangladesh where literacy problems in data collection also arise.

Methods

The study was conducted between March 2007 and July 2007. We purposefully selected two sites for data collection, one in urban Dhaka and the other in sub-urban Sylhet, with the aim of maximising the response rate. The two specific sites of data collection were the Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM) Hospital at Dhaka, and the Diabetic Association of Bangladesh (DAB) Hospital at Sylhet. Individuals who spoke Sylheti and were attending either the outpatient department of BIRDEM Hospital, Dhaka, or the DAB Hospital, Sylhet, for consultation for type 2 diabetes were approached by one of the investigators (TR) and invited to participate in the study. An attempt was made to recruit an equal number of participants from each hospital.

In both settings, consecutive attendees in the diabetes outpatient department were approached. Medical officers or resident physicians assisted with recruitment by allowing the researcher to sit in on consultations, during which time the study could be explained, and the patient invited to participate. The original protocol was approved by the East Birmingham Local Research Ethics Committee. The modified protocol for undertaking the study in Bangladesh was reviewed by project team members prior to obtaining ethical approval to carry out the study, from both the BIRDEM and DAB hospital authorities.

A demographic form used in the previous study (Lloyd *et al*, 2008b) was modified for use in Bangladesh and used to assess eligibility (see Box 1). All participants had type 2 diabetes, but eligibility was not linked to the type of treatment they received. Consequently, participants could be on any treatment regime. Assessment of duration of diabetes was derived from answers to the single item concerning how long the participants had been treated for the condition.

Those who agreed to take part were invited to move to a separate consulting room in order to test out the audio method of data collection. Female participants were accompanied by either a female member of

Box 1 Eligibility criteria

1.1 How old were you at your last birthday? I mean, your current age.
Age (years) . . ..

1.2 Sex
☐ Male   ☐ Female

1.3 What is the highest level of schooling you completed?
☐ None   ☐ Primary (1–5)   ☐ High school (6–10)   ☐ College/university

1.4 Do you usually live in a city, a town or in a rural village?
☐ Village (Rural)   ☐ City/town (urban)

1.5 Do you have type 2 diabetes?
☐ Yes   ☐ No

1.6 How old were you when your diabetes was first diagnosed?
Age (years) . . ..

1.7 How long have you been receiving treatment for your diabetes?
Years . . ..

1.8 Are you currently on insulin for your diabetes?
☐ Yes   ☐ No

1.9 How long have you been on insulin?
Years . . .. Months . . ..

1.10 Were you on tablets prior to that?
☐ Yes   ☐ No

1.11 Which part of Bangladesh are/were you originally from?
☐ Sylhet   ☐ Dhaka   ☐ Other . . ..

1.12 Language skills: can you speak in Sylheti and/or Bengali?
☐ Sylheti   ☐ Sylheti + Bengali   ☐ Bengali + others

1.13 Can you speak, read and write in Bengali?
☐ speak only, can't read/write   ☐ read/write only, can't speak
☐ Can speak, read and write   ☐ None

1.14 What language/dialect do you usually use at home?
☐ Bengali   ☐ Sylheti   ☐ Others . . ..

1.15 What language/dialect do you usually use to speak with other people (friends, other members of same community)?
☐ Bengali   ☐ Sylheti   ☐ Others . . ..

hospital staff or the person attending the hospital with them. Audio consent was taken from each participant using an audio-cassette recorder and a copy of the audio-recorded consent given. After being given a further explanation of the process of audio data collection and a brief demonstration on how to use the audio equipment, pre-recorded audio questionnaires were then self-administered using a portable audio-cassette player and a headphone as shown in Figure 1. Respondents listened to each question and provided answers using the appropriate answer sheets (see Figure 1). This technique ensures a completely standardised process, with respondents hearing all the questions in the same way.

Figure 1 Equipment/tools used for audio questionnaires administration

Two questionnaires were tested: the Revised Diabetes Knowledge Scale (RDKS; Fitzgerald *et al*, 1998; see Box 2) and the Diabetes Management Self-Efficacy Scale (DMSES) (Sturt and Hearnshaw, 2003; see Box 3). The RDKS is an adapted version of the Michigan Diabetes Knowledge Scale which was revised because certain terms were inappropriate for use in populations outside the USA. The RDKS consists of 20 multiple choice questions including items on diet, blood glucose control, exercise, medication taking and complications. Participants were asked to indicate their preferred answer to each question on a numbered score sheet. The DMSES has recently been revalidated for the measurement of diabetes management self-efficacy in UK populations. It consists of 15 items on confidence in performing various aspects of self-care, including medication taking, diet, blood glucose monitoring and exercising. A colour-shaded Likert-type scale (0–10) was used, in order for the respondents to indicate how confident they were in performing each aspect of diabetes self-care. Lighter shading and lower numbers indicated lower levels of confidence, whereas darker shading and higher numbers indicated higher levels of confidence in self-care. Prior to this study, audio versions of both questionnaires were developed in Sylheti and evaluated through consultation with a group of Sylheti-speaking individuals with type 2 diabetes attending diabetes outpatient departments in Birmingham, UK (Lloyd *et al*, 2008b).

Following questionnaire completion, each participant took part in a brief interview with the researcher, who completed an evaluation proforma for each questionnaire. The evaluation proforma, developed during a previous study (Lloyd *et al*, 2008b), was used to assess participants' opinions on the administration and completion of audio-assisted methods. Questions on the proforma included ones on the ease of administration and ease of completion, with answers on a colour-shaded Likert-type scale of 0 (very easy) to 10 (very hard or difficult). Ease of administration was measured by responses to the question 'did the participant find it easy or hard to understand the items on the questionnaire?'. Ease of completion was recorded in a similar way, measured by the response to the question 'did the participant find it easy or hard to complete the questionnaires?'. For the analysis, responses on this scale were collapsed into four groups: easy (0–2), fair (3–5), fairly difficult (6–8) and difficult (9–10). Participants were also asked to indicate which questions or particular terms they found unclear, if any; whether they preferred one questionnaire to the other and if so the reasons for this. The time taken by each participant to complete each questionnaire was also recorded.

Results

A total of 58 patients, 29 from each hospital, were approached to take part. Fifty participants (BIRDEM: 24; DAB Sylhet: 26) who fulfilled the study selection criteria participated in the study, giving response rates of 83% and 90%, respectively (see Table 1).

Table 1 shows a number of key characteristics of the study population. The mean age of the sample was 55 years, and this did not differ significantly between the two centres. The mean age at diagnosis of diabetes was 40 years, with 40% of all participants reporting that they were currently on insulin for their diabetes. All those currently taking insulin reported taking oral medications prior to insulin. Somewhat more men than women took part in the study, with 58% of participants in both centres being men. As the table shows, a slightly greater proportion of participants from the DAB Sylhet had received no education compared to those from the BIRDEM. Whereas nearly three-quarters of those attending the DAB Sylhet described living in a rural environment, only one-quarter of those attending the BIRDEM did so. A high proportion of participants from both centres spoke only Sylheti, and approximately half were not able to read or write Bengali.

Ease of administration

Overall, study participants did not report any difficulties understanding the terms used in either of the questionnaires. A comparison of responses according to background characteristics is shown in Table 2. There were no significant differences observed in response levels for either questionnaire in terms of sex or hospital attended. Younger participants (age group 30–39 years) found the knowledge questionnaire easier to understand than older participants (age group 60+ years; $P = 0.002$). Additionally, ease of understanding the knowledge questionnaire was significantly associated with participants' level of education, place of residence, level of spoken language skill and level of written language skill. There was no significant difference observed in the level of understanding of the self-efficacy questionnaire except with regard to place of residence, with those living in urban areas more likely to report a greater ease of understanding of the questionnaire compared to participants living in rural areas ($P < 0.05$; see Table 2).

Ease of completion

Participants did not report any problems in completing the questionnaires. Table 3 shows a comparison of responses according to background characteristics

Box 2 Revised Michigan Diabetes Knowledge Questionnaire

The following questions deal with knowledge associated with diabetes mellitus. Unless indicated in the question, please circle the *one* correct answer to each question.

1   The diabetes diet is:
    a   the way most people eat
    b   a healthy diet for most people
    c   too high in carbohydrate for most people
    d   too high in protein for most people

2   Glycosylated haemoglobin (HbA_{1c}) is a test that measures your average blood glucose level for the past:
    a   day
    b   week
    c   6–10 weeks
    d   6 months

3   Which of the following is highest in carbohydrate?
    a   1 lb of chicken
    b   1 lb of cheese
    c   1 lb of potatoes
    d   1 lb of margarine

4   Which of the following is highest in fat?
    a   Semi-skimmed milk
    b   Orange juice
    c   Sweet corn
    d   Honey

5   Which is the most accurate method for testing blood glucose?
    a   Urine testing
    b   Blood testing
    c   Both are equally good

6   What effect does unsweetened fruit juice have on blood glucose?
    a   Lowers it
    b   Raises it
    c   Has no effect

7   Which should *not* be used to treat low blood glucose?
    a   3 boiled sweets
    b   A glass of orange juice
    c   1 can of diet soft drink
    d   A glass of skim milk

8   Which of the following can help prevent raised cholesterol in the blood?
    a   Using olive oil in cooking
    b   Using vegetable oil in cooking
    c   Using butter in cooking
    d   None of the above

9   Which of the following can help reduce high blood pressure? (Tick all that apply)
    a   Exercising
    b   Resting
    c   Losing weight
    d   Stopping smoking

10   For a person in good control, what effect does exercise have on blood glucose?
    a   Lowers it
    b   Raises it
    c   Has no effect

Box 2 Continued

11   Infection is likely to cause:
    a   an increase in blood glucose
    b   a decrease in blood glucose
    c   no change in blood glucose

12   How should you take care of your feet?
    a   look at and wash them each day
    b   massage them with alcohol each day
    c   soak them for one hour each day
    d   buy shoes a size larger than usual

13   Eating foods lower in fat decreases your risk for:
    a   nerve disease
    b   kidney disease
    c   heart disease
    d   eye disease

14   Numbness and tingling may be symptoms of:
    a   kidney disease
    b   nerve disease
    c   eye disease
    d   liver disease

15   Which of the following is usually *not* associated with diabetes?
    a   vision problems
    b   kidney problems
    c   nerve problems
    d   lung problems

16   If you are sick with the flu, which of the following changes should you make?
    a   Take less medication for your diabetes
    b   Drink less liquid
    c   Eat more protein
    d   Test for glucose more often

<div align="center">SKIP TO QUESTION 20 IF YOU DON'T TAKE INSULIN</div>

17   You realise just before lunch time that you forgot to take your insulin before breakfast. What should you do now?
    a   Skip lunch to lower your blood glucose
    b   Take the insulin that you usually take at breakfast
    c   Take twice as much insulin as you usually take at breakfast
    d   Check your blood glucose level to decide how much insulin to take
    e   Don't take any extra insulin but eat lunch

18   Low blood glucose may be caused by:
    a   too much insulin
    b   too little insulin
    c   eating too much food
    d   too little exercise

19   If you take your morning insulin but skip breakfast your blood glucose level will usually:
    a   increase
    b   decrease
    c   remain the same

20   Attending your diabetes appointments will:
    a   stop you getting complications
    b   increase the chance of spotting complications early on
    c   have no effect on your chance of getting complications

<div align="center">THANK YOU FOR YOUR TIME!</div>

Box 3 Diabetes Management Self-efficacy Scale (or Confidence Questionnaire) for people living with type 2 diabetes

Directions
Below is a list of activities you have to perform to manage your diabetes. Please read each one and then put a line through the number which best describes how *confident* you usually are that you could carry out that activity.

For example, if you are completely confident that you are able to check your blood sugar levels when necessary, put a line through 10. If you feel that most of the time you could not do it, put a line through 1 or 2.

Please note ...
Eating pattern refers to the general eating rules that people try to keep to, e.g. eating 5 fruits/vegetables each day
Eating plan refers to the plan for this meal/this day, e.g. do I need to have 2 or 3 pieces of fruit/vegetable during this meal to ensure I have my 5 a day?

I am confident that ...

Cannot do at all	Maybe yes, maybe no	Certain can do

1 I am able to check my blood sugar/urine if necessary
    1   2   3   4   5   6   7   8   9   10

2 I am able to correct my blood sugar when the sugar level is too high
    1   2   3   4   5   6   7   8   9   10

3 I am able to correct my blood sugar when the blood sugar level is too low
    1   2   3   4   5   6   7   8   9   10

4 I am able to choose the correct foods
    1   2   3   4   5   6   7   8   9   10

5 I am able to keep my weight under control
    1   2   3   4   5   6   7   8   9   10

6 I am able to examine my feet for cuts
    1   2   3   4   5   6   7   8   9   10

7 I am able to adjust my eating plan when ill
    1   2   3   4   5   6   7   8   9   10

8 I am able to follow a healthy eating pattern most of the time
    1   2   3   4   5   6   7   8   9   10

9 I am able to take more exercise if the doctor advises me to
    1   2   3   4   5   6   7   8   9   10

10 When taking more exercise I am able to adjust my eating plan
    1   2   3   4   5   6   7   8   9   10

11 I am able to follow a healthy eating pattern when I am away from home
    1   2   3   4   5   6   7   8   9   10

12 I am able to follow a healthy eating pattern when I am eating out or at a party
    1   2   3   4   5   6   7   8   9   10

13 I am able to adjust my eating plan when I am feeling stressed or anxious
    1   2   3   4   5   6   7   8   9   10

14 I am able to take my medication as prescribed
    1   2   3   4   5   6   7   8   9   10

15 I am able to adjust my medication when I am ill
    1   2   3   4   5   6   7   8   9   10

Table 1 Distribution of the participants according to demographic information and literacy skill according to hospital

	All participants (*n* = 50)		BIRDEM, Dhaka (*n* = 24)		DAB, Sylhet (*n* = 26)	
	Mean (SD) or %	*n*	Mean (SD) or %	*n*	Mean (SD) or %	*n*
Age (years)	54.5 (6.9)	50	52.85 (6.9)	24	56.2 (6.6)	26
Sex (% male)	58	29	58.3	14	57.7	15
Age when diagnosed (years)	40.4 (3.4)	50	40.3 (3.4)	24	40.4 (3.5)	26
Time since diagnosis (years)	14.2 (6.7)	50	12.5 (6.3)	24	15.8 (6.8)	26
% on insulin	40	20	38	9	42	11
Education (%)						
No education	24	12	21	5	27	7
Primary	46	23	46	11	46	12
Secondary+	30	15	33	8	27	7
Residence (%)						
Rural	50	25	25	6	73	19
Urban	50	25	75	18	27	7
Spoken language skill (%)						
Sylheti only	68	34	63	15	73	19
Sylheti + Bengali	32	16	38	9	27	7
Bengali language skill (%)						
None	52	26	42	10	62	16
Read/write only	14	7	17	4	12	3
Can speak, read and write	34	17	42	10	27	7

in terms of ease of completion for the knowledge questionnaire (KQ) and self-efficacy questionnaire (SEQ). There was no significant difference observed in response level for either questionnaire according to hospital, age, sex or place of residence. Individuals who reported finding the knowledge questionnaire easier to complete had a higher level of education and were more likely to speak, read and write both Sylheti and Bengali. There were no significant differences observed in ease of completion of the self-efficacy questionnaire when compared with the same parameters, for example, level of education, language skills (see Table 3).

A preference for one questionnaire over the other was indicated by participants at both centres, although this was more pronounced at the DAB Sylhet hospital, with 81% of these participants preferring the self-efficacy questionnaire compared to 58% of the participants from BIRDEM. An overwhelming majority

found the self-efficacy questionnaire easier to complete compared to the knowledge questionnaire (DAB Sylhet 96%; BIRDEM 100%). Those with lower levels of education were more likely to report a preference for the self-efficacy questionnaire; 83% of those with no education or primary-level education reported a preference for this questionnaire compared with 40% of those with secondary-level or higher education ($P < 0.001$). Those who lived in rural areas were also significantly more likely to report a preference for the self-efficacy questionnaire (84% versus 56% for those from urban areas).

The mean time taken to complete the knowledge questionnaire and the self-efficacy questionnaire was 26.62 ($\pm$4.17) minutes and 14.90 ($\pm$2.24) minutes respectively. Non-literate and less educated participants took more time to complete both questionnaires. Participants with higher levels of education

Table 2 Ease of administration according to background characteristics

	Ease of administration: KQ		Ease of administration: SEQ	
	Easy (0–2) % (n)	Fair (3–5) % (n)	Easy (0–2) % (n)	Fair (3–5) % (n)
Hospital				
BIRDEM, Dhaka ($n = 24$)	50 (12)	50 (12)	96 (23)	4 (1)
DAB, Sylhet ($n = 26$)	31 (8)	69 (18)	92 (24)	8 (2)
Age (years)				
40–49	73 (11)	27 (4)	100 (15)	(0)
50–59	36 (8)	64 (14)	95 (21)	5 (1)
60+	7 (1)**	93 (12)	85 (11)	15 (2)
Sex				
Male	41 (12)	59 (17)	96 (28)	4 (1)
Female	38 (8)	62 (13)	90 (19)	10 (2)
Education				
None/primary	17 (6)	83 (29)	91 (32)	9 (3)
Secondary+	93 (14)**	7 (1)	100 (15)	–
Residence				
Rural	12 (3)	88 (22)	88 (22)	12 (3)
Urban	68 (17)**	32 (8)	100 (25)	0 (0)*
Years diagnosed				
≤10	65 (13)*	35 (7)	95 (19)	5 (1)
11–20	33 (7)	67 (17)	95 (20	5 (1)
21–30	–	100 (9)	89 (8)	11 (1)
Spoken language skill				
Sylheti only	15 (5)	85 (29)	91 (31)	9 (3)
Sylheti + Bengali	94 (15)**	6 (1)	100 (16)	–
Bengali language skill				
None	4 (1)	96 (25)	88 (23)	12
Read/write only	43 (3)	57 (4)	100 (7)	–
Speak, read and write	94 (16)*	6 (1)	100 (17)	–

* $P < 0.05$; ** $P < 0.001$

also displayed greater confidence levels while using the audio methods of data collection compared to those with lower levels of education.

Discussion

This study has shown that it is possible to administer self-completed questionnaires in populations where literacy levels are low, in order to establish levels of knowledge and self-efficacy for diabetes self-care. Rates of diabetes in Bangladesh are increasing and pose a serious public health problem. Ways of improving access to information in order to provide high standards of care are essential. Approximately one-third of the population in Bangladesh has received no formal education, with illiteracy levels highest in the Sylhet region and among women (National Institute of Population Research and Training, 2008). The majority of those who have received some education have not gone beyond primary level. The use of alternative methods of data collection in areas where literacy levels are low can help to improve both participation rates in research and, more generally, in terms of obtaining the views of individuals who are often excluded from participating fully in their healthcare.

The use of audio methods of data collection was seen as completely acceptable by those who participated in the study, with the majority of individuals

Table 3 Ease of completion according to background characteristics

	Ease of completion: KQ	Ease of completion: SEQ		Ease of completion: KQ
	Easy (0–2) % (n)	Fair (3–5) % (n)	Easy (0–2) % (n)	Fair (3–5) % (n)
Hospital				
BIRDEM, Dhaka ($n = 24$)	92 (22)	8 (2)	100 (24)	–
DAB, Sylhet ($n = 26$)	81 (21)	19 (5)	96 (25)	4 (1)
Age (years)				
40–49	93 (14)	7 (1)	100 (15)	–
50–59	91 (20)	9 (2)	100 (22)	–
60+	69 (9)	31 (4)	92 (12)	8 (1)
Sex				
Male	90 (26)	10 (3)	100 (29)	–
Female	81 (17)	19 (4)	97 (20)	3 (1)
Education				
None/primary	80 (28)	20 (7)	91 (34)	9 (1)
Secondary+	100 (15)*	–	100 (15)	–
Residence				
Rural	80 (20)	20 (5)	96 (24)	4 (1)
Urban	92 (23)	8 (2)	100 (25)	–
Years diagnosed				
≤10	95 (19)	5 (1)	100 (20)	–
11–20	81 (17)	19 (4)	100 (21)	–
21–30	78 (7)	22 (2)	89 (8)	11 (1)
Spoken language skill				
Sylheti only	79 (27)	21 (7)	97 (33)	3 (1)
Sylheti + Bengali	100 (16)*	–	100 (16)	–
Bengali language skill				
None	73 (19)	27 (7)	94 (25)	6 (1)
Read/write only	100 (7)	–	100 (7)	–
Speak, read and write	100 (17)*	–	100 (17)	–

* $P < 0.05$

reporting no difficulties with questionnaire completion. However, some differences in ease of administration and completion for the two questionnaires were observed. The self-efficacy questionnaire was found to be easier to understand and easier to complete compared to the knowledge questionnaire. It also took much less time to complete. When specifically asked for a preferred questionnaire, the majority indicated a preference for the self-efficacy questionnaire, which may be perceived as less threatening than the knowledge questionnaire.

Individuals who reported finding the knowledge questionnaire easy to complete had a higher level of education and were more likely to speak both Sylheti and Bengali compared to those who found this questionnaire more difficult. These differences were not observed for the self-efficacy questionnaire, and nearly all participants found this easy to complete. This may be because this questionnaire records felt ability or perceived confidence in performing practical tasks associated with diabetes self-management; it does not formally explore the level of diabetes knowledge. Our previous work also indicated that the Sylheti men preferred the self-efficacy questionnaire over the knowledge questionnaire (Lloyd *et al*, 2008b). In this previous research many of our participants were concerned about getting the knowledge questions right, even when they were assured that the reason for

consulting them was to ensure that the content and form of delivery were appropriate, rather than to test their knowledge.

The self-efficacy questionnaire is likely to be less challenging compared to the knowledge questionnaire when using an audio version, as there are no correct answers and responses are recorded on a colour-shaded Likert-type scale. Conversely, the design of the knowledge questionnaire requires respondents to remember four alternative answers to each question, and there are correct and incorrect answers. This may be perceived as much more threatening compared to the self-efficacy questionnaire.

The knowledge questionnaire took, on average, nearly 30 minutes to complete, whereas the self-efficacy questionnaire took approximately half this time. Although participants were happy to take the time to complete these questionnaires, this may not be practical in a busy clinic setting where a large number of patients is waiting to be seen. It may be more appropriate to complete these questionnaires prior to diabetes education sessions, so that the data inform the content or focus of the session. Using an independent audio method to collect data ensures confidentiality and would encourage those with poorer literacy skills to complete questionnaires.

There are limitations to these data, including the small sample size. However, this was an exploratory study in which we wanted to further develop our audio methods of questionnaire administration, rather than come to any firm conclusions with regard to the level of diabetes knowledge or self-efficacy in this population. This study has demonstrated the usefulness of this method of data collection. It is clearly an acceptable mode and easy to administer, with little difficulty experienced from the perspective of the participant. Albeit with the caveats noted above, particularly with regard to the knowledge questionnaire, wider use of this questionnaire could assist in exploring knowledge and self-efficacy levels prior to any education intervention to improve self-management of diabetes.

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CONFLICTS OF INTEREST

None.

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