

Conference papers

The development and evaluation of alternative communication strategies to facilitate interactions with Somali refugees in primary care: a preliminary study

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ABSTRACT

The work reported in this paper forms part of a larger project to develop and evaluate alternative forms of communication to facilitate cross-cultural consultations in primary care. As a case study and proof-of-concept, work was conducted with Somali refugees who tend to experience significant communication difficulties in primary care consultations.

The alternative communication methods developed in this study originate from the field of Augmentative and Alternative Communication (AAC). These methods may include non-verbal communication or aided communication using a mix of pictographic symbols, bilingual text and digitised (recorded) or synthetic speech. These can be delivered on a range of paper-based or computer-based devices.

A paper-based and computer-based method was developed to assess whether a group of literate and illiterate Somalis were able to answer a set of questions using these tools. The purpose of this preliminary study was to assess whether either of these communication methods were suitable for further evaluation in primary care consultations.

Twenty Somalis were presented with three communication tools and were asked a set of general questions in Somali which they had to answer using each tool: (1) a paper-based communication book containing symbols and bilingual text labels; (2) a laptop PC with mouse pad containing the same symbols, text labels and augmented with digitised Somali speech; (3) a tablet PC with touch screen containing the same software and digitised Somali speech. These two computer-based delivery platforms were compared for ease of use among a participant group who are likely to have little computing experience.

Each task was timed and scored for level of correctness; feedback was gained from Somalis and experimenters' observations were noted. Participants clearly found the computerised devices with Somali speech output easier to use and more acceptable than the simpler paper-based device.

Keywords: Augmentative and Alternative Communication, provider–patient interaction, Somali refugees

Introduction

Significant numbers of Somali refugees and asylum seekers are still entering the UK as a result of the continuing war in Somalia.¹ Somali refugees tend to have very limited English and literacy skills as a result of poor schooling opportunities in Somalia; consequently they experience communication difficulties during healthcare consultations.² A literature review highlighted a distinct lack of research investigating innovative communication strategies to tackle this problem when interpreters are unavailable. Most studies investigating language barriers still tend to recommend using professional interpreters, despite the reported lack of such services in reality.^{3–5} *Language Line* is a remote interpreting service available, but interviews with providers in an earlier phase of the larger project demonstrated that this service is hardly ever used with Somali refugees. Others have suggested trying portable translation devices or pictographic symbols on cards to support communication,⁶ an approach that we investigate here.

The work reported here forms part of a larger study, the intention of which is to investigate the use of computer-based systems to support communication between healthcare providers and Somali patients with limited English and literacy. This study comprises three phases:

- I interviewing practitioners and conducting focus groups with Somalis to establish specific communication difficulties and strategies currently employed to overcome these
- II evaluating two different communication media with Somalis (reported here)
- III evaluating the use of this technology to facilitate history taking in a simulated asthma review with practitioners and Somalis.

The methods being investigated originate from the field of Augmentative and Alternative Communication (AAC), a branch of speech and language therapy that provides alternative or supplementary forms of communication for individuals with communication impairment. AAC methods generally use pictographic symbols to represent words and phrases. When supported by computer-based systems, symbols and text are often supplemented by digitised (recorded) or synthetic speech.

Newell^{7,8} highlights the benefits of using technology designed for people with disabilities with non-disabled people. Alm *et al*⁹ designed an interactive multilingual communication system called 'Unicorn' for people with communication impairments, but also recognise its potential use with people whose first language is not English. Building on this work, Johnson¹⁰ suggests that symbol-based communication devices with

digitised speech could offer an alternative communication strategy to facilitate clinical consultations with patients with limited English and literacy.

The NHS IT strategy¹¹ was designed to modernise clinical practice and improve communication between practitioners to support patient-centred care. However, the use of the practitioner's computer as a communication aid in cross-cultural healthcare consultations has not been investigated. Although AAC efficacy studies have been conducted to compare the use of several different communication systems with people who use AAC,^{12–14} the effectiveness of using computerised AAC systems in clinical consultations with patients with limited English has not been investigated. Similarly, pictographic symbols have been added to printed information and departmental signs in hospitals and surgeries to increase access for people with communication impairments and patients whose first language is not English.^{15–17} However, these strategies have not been applied to provider-patient interactions during primary care consultations with patients with limited English.

The objective of this study is to explore the acceptability and usability of two different communication strategies for answering a set of questions with literate and illiterate Somalis. This pilot work is paramount in an exploratory study of this nature¹⁸ and will inform the design of the system to support communication in the simulated asthma reviews that form phase III of the larger project.

Development of the communication methods to test with Somalis

Choice of communication devices

The choice of communication methods was based upon the following factors:

- The practitioner interview and Somali focus group data from the larger study indicated that the communication methods chosen had to address the patients' expressive and receptive communication and their literacy needs.
- A previous evaluation of different AAC methods by Johnson¹⁰ suggested paper-based and computerised aids with symbols, bilingual text and digitised speech might be suitable to support communication for people with limited English and literacy.
- Findings from symbol assessments with Somalis and English-speaking nursing students indicated that these groups perceived symbols in different ways. Somalis found symbols representing nouns

the easiest to interpret and had more difficulty with more abstract verbs and adjectives. This suggested that one of the communication methods chosen had to involve Somali speech to support the symbol meanings where they might be harder to interpret.

These factors led to the decision to develop a paper-based and a computer-based tool and to test two hardware devices with different input methods (a laptop and tablet PC). Clicker 4 (produced by Crick Software) was the package loaded onto the PCs and used to create the paper-based device. This is a commercially available software package designed to support literacy in schools. It offered a very user-friendly and flexible interface that was amenable to adaptation for the purposes of this research.

Choice of test questions

Four sets of ten questions were used to assess the communication methods. It was decided that general questions regarding daily or common tasks would be suitable for this pilot. The questions and the set of possible responses were translated into Somali. The choice of questions was guided by the following principles.

Firstly, the questions had to yield a closed set of responses so that all of these could be presented to the participant on a single screen or page. Once appropriate responses to the questions had been devised, symbols representing these concepts were identified.

Secondly, the questions had to be within the experience of the participants in order to yield natural responses. It was decided that general questions regarding daily or common tasks would be more suitable for this stage of testing than health-related questions. Focusing on specific asthma-related questions containing potentially unfamiliar concepts could have detracted from the main task and might have negatively affected participants' performance and biased the results.

Finally, the style of questions was based upon those likely to be asked during a healthcare consultation, although the content was not health related. This was done by consulting completed asthma history sheets containing standard questions and anonymised patient responses from practitioners in phase I. The questions were varied so as to elicit different types of responses. For example, two questions in each set required a yes/no answer; others required test subjects to select times of the day or to indicate periods and frequencies. An example of a set of test questions is given in Box 1. All four sets presented the same style of questions, in the same order, with the same or very similar set of response options.

Box 1 Exemplar set of test questions

Q1. Have you ever smoked?

Response options: Yes, No, I don't know, Never

Q2. What are you allergic to?

Response options: Cat, Flowers, Dust, Sun, Dog, Grass, Smoke, Milk, None of these

Q3. How many times have you woken up in the night in the past week?

Response options: Once, Twice, Three times, More, Not at all

Q4. At what time of the day do you generally feel best?

Response options: Morning, Afternoon, Evening, Night

Q5. What do you think of the weather this week?

Response options: Good, Bad, OK

Q6. When did you last eat?

Response options: Today, Yesterday, In the last week, Before then

Q7. When did you last fly in an aeroplane?

Response options: Today, This week, This month, This year, Never

Q8. How often do you shop for food in a week?

Response options: Once, Twice, More often, Less often, Never

Q9. What time did you get up today (approximately)?

Response options: 6 a.m., 7 a.m., 8 a.m., 9 a.m., Earlier, Later

Q10. Do you like biscuits?

Response options: Yes, No, I don't know, Never

Designing the sheets on the paper-based device

The paper-based method was presented as a communication book containing ten pages, each with a number of pictographic symbols accompanied by Somali and English text labels printed underneath; each question and corresponding response options occupied one page of the book. When designing this low-tech method, the aim was to ask Somali participants a set of questions using natural Somali speech (via the Somali research assistant) and encourage them to point to the symbols and text labels on the paper to help them answer the question. It should be noted that Somali speech could not be generated using this paper-based method in a healthcare consultation.

The focus with this communication platform was on the Somalis' comprehension of the symbols and text labels and how well they used these to respond to the questions.

Designing the screens on the computer-based device

Ten response option screens also had to be created using the Clicker 4 software for the computer-based devices. When designing the screen layout, important considerations included the target user group's potential lack of computing experience and literacy skills. To make the selection of response options as easy as possible, the size of the response option buttons was maximised, as shown in Figure 1. This in turn increased the size of the symbols and text within the cell. It was also felt that making the other function buttons (for example, 'repeat question' and 'next') a different and smaller size would minimise the chances of confusion over the different types of buttons. The use of arrows and consistent positioning of the other function buttons was employed to further distinguish them from the response option buttons.

The fundamental difference between the computer-based and paper-based communication platforms is the facility for recorded Somali speech on the former. To further enhance understanding, all questions and response options were recorded in Somali by a native speaker as .wav files and added to each question and response option. This speech option could be selected and played at any time. It was anticipated that the illiterate Somali participants would need the speech output if they were unable to understand the symbol meanings or read the associated text labels.

Figure 1 shows the English equivalent (the experimental system used Somali text) of the screen for the question 'At what time of the day do you feel best?' The question is spoken (in digitised Somali speech) when the screen first appears, and can be replayed at any

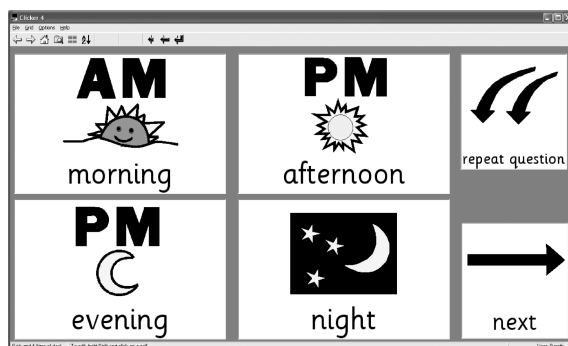


Figure 1 The English equivalent of the screen for 'At what time of the day do you feel best?'

time by selecting the 'repeat question' symbol. When one of the symbols (the four to the left in Figure 1) is selected, Somali speech is played. The participant can select as many of the symbols as he/she likes, listening to the spoken meaning. The participant will decide upon his/her answer, indicate what this is by selecting an option on the screen and move to the next question by selecting the 'next' symbol.

Methods

Study sites and sample

Twenty native Somali speakers were recruited as healthy volunteers. Ten were literate in Somali and were English speakers; the second ten were illiterate and unable to speak English. A Somali researcher employed a previously successful purposive snowball sampling strategy within Manchester's Somali community. All had self-reported normal hearing and vision and were unfamiliar with the communication methods under investigation. Data collection was conducted in a local Somali community centre or in participants' homes.

Data collection methods

Twenty Somalis were tested individually. A Somali researcher conducted all tests in Somali. Each session was video-recorded for later observational analysis. Each participant answered one of the sets of ten questions with each of the communication methods; the question sets were randomised in order and across the communication methods. In answering the questions, participants were encouraged to vocalise their response so this could be checked against the symbol they selected to determine correctness. Times for the experiments were noted and feedback was gained through interview in Somali immediately after each test.

Data analysis methods

Mean response latency times were calculated for each device for literate and illiterate groups. The number of incidences of 'verbal-to-symbol disagreements' and 'no relevant response options' were recorded and collated from video observations of the two groups. A basic thematic analysis was conducted on the participant feedback gained, including a count of the preferences for each device.

Results

The mean age was 43 (range 17–75). The key demographic data is given in Table 1. Noteworthy participant characteristics include the fact that only half (5/10) of the illiterate participants and 7/10 of the literate participants had ever used a computer. These characteristics might have a bearing on how easy participants find using the computer-based devices and whether they prefer these to the paper-based device.

Table 1 Characteristics of the Somali sample ($n=20$)

Gender	Literate ($n=10$)	Illiterate ($n=10$)
Male	5	0
Female	5	10
Level of education (years)		
No schooling	0	3
Schooling	10	7
• ESOL (English for Speakers of Other Languages) classes in UK only	0	6
• Elementary in Somalia	3	1
• Intermediate/secondary in Somalia	3	0
• University	4	0
Ever used a computer		
Yes	7	5
No	3	5

Level of correctness of answers

Eight of the ten illiterate participants demonstrated verbal-to-symbol disagreement on two or three of the questions using the paper communication book (that is, the verbalised answer was different from the symbol they selected). These errors were not made on either of the computerised devices with Somali speech output. In addition to these errors, 80% of all participants said there was no relevant answer to select for at least one question; this was probably a limitation of the test instrument rather than participant error.

Test times

On average, participants answered the set of ten questions in the quickest time using the tablet PC. The second quickest method was the paper. The longest method was the laptop PC. This pattern was consistent across both literate and illiterate groups. Illiterate participants, however, on average took more than twice as long to respond to the questions using each device, as Figure 2 shows.

Participant preferences

Seventeen of the 20 participants expressed a preference for the computer-based platforms. The same number of participants expressed a preference for the tablet PC (9) and the laptop PC (9). One participant stated a preference for both computer-based platforms rather than indicating a preference for one or the other.

Usability observations and feedback

Paper method

Pointing to symbols or their word labels on the paper devices to answer questions was considered the simplest, although not the preferred method by most

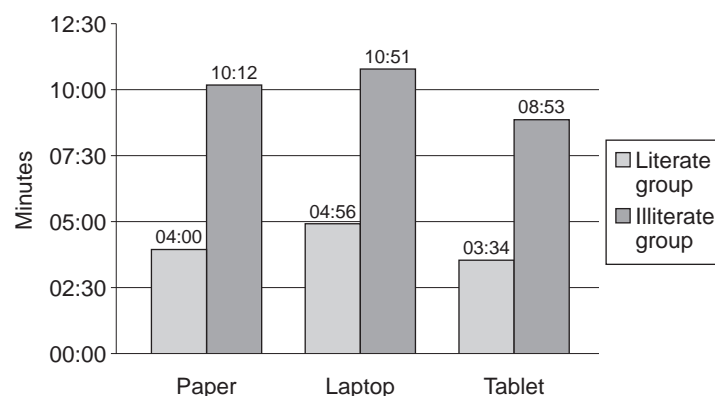


Figure 2 Mean response latencies for literate and illiterate participant groups

literate participants. Only three Somalis preferred the paper method, and reported this was because they were more familiar with using paper than computers. However, the illiterate participants, who were unable to understand the writing or symbols, found the paper-based method the hardest to use. One illiterate participant could read one or two words of English which helped her answer a few questions. All participants said some of the symbols were easy (for example, fruit, drinks, allergy choices, emotions), but many were too hard to understand on their own (such as the temporal symbols 'today', 'yesterday', 'last year', symbols with arrows, and so on).

Tablet and laptop methods

Pressing on the horizontal tablet screen with a stylus was found to be easier to understand than controlling the cursor on the laptop screen by moving a finger around the mouse pad, although several illiterate participants expressed a preference for using their finger on the mouse pad, despite being quicker using the stylus on the tablet. The positioning of the tablet PC (for instance, at different angles) was considered more flexible and interactive than the laptop. The difference in the volume of the digitised speech from the two computer-based devices caused some comment. The laptop was preferred by some participants solely because the speech volume was higher than that of the tablet PC. This issue could be addressed by attaching external, amplified speakers to the tablet PC. All illiterate participants said they needed the speech output to support the meaning of the symbols and most of the literate participants said it gave them more confidence that they were selecting the correct answer. Several participants felt the technology options would be best once they understood fully how to use the devices.

Discussion

The aim of the study was to explore which of these communication methods a group of literate and illiterate Somalis found the most acceptable and easy to use when answering a set of questions.

The results clearly demonstrate that the computer-based communication platforms were more successful than the paper-based device in answering a set of questions. The differentiating factor was the Somali speech output, which proved essential for the illiterate participants because they were unable to rely upon symbols and text labels to respond to certain questions. The difficulties experienced with the paper-based device suggest this is not a suitable or reliable

communication method to use in a primary care setting where the exchange of accurate information is essential.

Participants did not express a particular preference overall for the laptop or tablet PC; this suggests that both delivery platforms could be suitable for further testing in phase III of the larger study. However, participants mastered the use of the tablet more quickly, suggesting that this device might empower the patient more in the communication process if they were able to use it independently to respond to the practitioner's questions during a consultation. This aspect needs to be studied further in phase III.

The speech output facility enabled Somalis with limited English and literacy to understand all the questions asked without the help of an interpreter. It also enabled understanding of all the response options and other functions buttons (such as 'repeat question', 'next') on the screen, which in turn enabled participants to select their response to each question independently. Literate Somalis with a better level of English used the speech output more to confirm meanings rather than having to rely solely on this facility for understanding, thus giving them more confidence that they were responding appropriately. This suggests that this might be a flexible system that could be useful for Somalis with different levels of English, not just those with very limited abilities.

The fact that only three literate participants expressed a preference for the paper-based device indicates that this group would still prefer to have the digitised speech option to augment their communication. Moreover, observations indicated that all Somalis liked hearing their own language and using it to communicate. This could prove an important motivating factor for future use with a group of potential users who are unfamiliar with and possibly anxious about using such technology.

Conclusions

This pilot has demonstrated that computerised communication devices with digitised Somali speech output can be used by Somalis with limited English and literacy to answer a set of questions. The paper-based device without digitised speech was shown to be ineffective with this user group due to literacy difficulties and symbol misinterpretation. As a result of this preliminary work, the two computer-based devices with digitised Somali speech were deemed suitable for testing with practitioners and patients in simulated consultations in phase III of the larger study.

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REFERENCES

- 1 Home Office. *Home Office Asylum Statistics, 2nd Quarter, United Kingdom*. 2005. www.homeoffice.gov.uk/rds/pdfs05/asylumq205.pdf
- 2 Harris H. *The Somali Community in the UK: what we know and how we know it*. London: King's College, 2004.
- 3 Gerrish K. The nature and effect of communication difficulties arising from interactions between district nurses and South Asian patients and carers. *Journal of Advanced Nursing* 2001;33:566-74.
- 4 Rhodes P and Nocon A. A problem of communication? Diabetes care among Bangladeshi people in Bradford. *Health and Social Care in the Community* 2003;11:45-54.
- 5 Murphy K and Macleod Clark J. Nurses' experiences of caring for ethnic minority clients. *Journal of Advanced Nursing* 1993;18:442-50.
- 6 Papadopoulos I and Alleyne J. Health of minority ethnic groups. In: Papadopoulos I, Tilki M and Taylor J (eds) *Transcultural Care: a guide for health care professionals*. Quay Books, 1998, pp. 1-17.
- 7 Newell AF. Speech communication technology: lessons from the disabled. *Electronics and Power* 1986: 661-4.
- 8 Newell AF. Speech technology: cross-fertilization between research for the disabled and the non-disabled. In: *Proceedings of the First ISAAC Research Symposium in Augmentative and Alternative Communication*, Stockholm, 1990: 131-4.
- 9 Alm N, Iwabuchi M, Andreasen PN and Nakamura K. A multi-lingual augmentative communication system. *Lecture Notes in Computer Science* 2615. Springer, 2002: 398-408.
- 10 Johnson MJ. What can we learn from drawing parallels between people who use AAC and people whose first language is not English? *Communication Matters* 2004; 18:15-17.
- 11 Department of Health. *Delivering 21st Century IT Support for the NHS: national strategic programme*. Department of Health. 2002. www.doh.gov.uk/ipu/whatnew/deliveringit/nhsitimplan.pdf
- 12 Fried-Oken M, Howard JM and Stewart SR. Feedback on AAC intervention from adults who are temporarily unable to speak. *Augmentative and Alternative Communication* 1991;7:43-50.
- 13 Doss LS, Locke P, Johnston S *et al*. Initial comparison of the efficiency of a variety of AAC systems for ordering meals in fast food restaurants. *Augmentative and Alternative Communication* 1991;7:256-65.
- 14 Dyches TT, Davis A, Lucido BR and Young JR. Generalization of skills using pictographic and voice output communication devices. *Augmentative and Alternative Communication* 2002;18:124-31.
- 15 Hartley K. *Better Health Through Better Communication Project: a pilot project aimed at improving access to primary care services for people with communication difficulties. Final report*. Edinburgh: East Lothian Local Healthcare Co-operative, 2003.
- 16 Burrell C. *Roodlands Hospital OPD 'Inclusive Communication' Project: results of consultation on environmental symbols*. Unpublished report. Edinburgh: East Lothian Local Healthcare Co-operative, November 2003.
- 17 Hartley K. *Sexual Health Leaflet Consultation Report*. Unpublished report. Edinburgh: Eastern General Hospital, March 2004.
- 18 Medical Research Council. *A framework for development and evaluation of RCTs for complex interventions to improve health*. 2004. www.mrc.ac.uk/pdf-mrc_cpr.pdf

CONFLICTS OF INTEREST

None.

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