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Attitudes and concerns of doctors and nurses about using a translation application for in-hospital brief interactions with Korean patients

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ABSTRACT

Background   New Zealand is becoming more ethnically diverse, with a rising number of people with limited English language proficiency. Consequently, hospital interactions are increasing where patients have insufficient English to communicate adequately with doctors or nurses for appropriate, effective and safe care. Translation technology is rapidly evolving, but evidence is limited regarding its usefulness to clinicians.

Objective   To examine the acceptability to doctors and nurses of a translation application (app) used on a tablet, in brief interactions with Korean patients.

Method   An app was developed to facilitate brief conversations between patients and clinicians as part of clinical care. We used the Technology Acceptance Model 2 to develop semi-structured interview questions for 15 junior and senior doctors and nurses in an urban hospital. Participants used the app to interact with the interviewer as part of a scenario. The interviews were analysed thematically.

Results   The app was easy to use, learn to use and to memorise for future use. It was considered useful for everyday brief interactions and urgent situations where there is no time to call an interpreter and, after hours, to augment the work of interpreters. Subject to perceived usefulness, there appears to be little need for social normalisation of a translation app, other than management support for the costs, maintenance and implementation of the app for everyday use.

Conclusion   Guidelines are required for the use of a translation app by doctors and nurses to augment the interpreter role. A larger study and future research on the patient's perspective are required.

Keywords: sociotechnical, translation, usefulness, ease of use, social influence, clinician

INTRODUCTION

Attempting to communicate with patients in the absence of a common language can be challenging and may result in poor health outcomes. New Zealand (NZ) is becoming more ethnically diverse, particularly within Auckland, which is the most diverse region of the country.[1] Asians represent 22% of the Auckland population, estimated to increase by more than 60% by 2026.[2] Effective communication between healthcare providers and patients is crucial for good medical care.[3]

Patient satisfaction, quality of care and health outcomes are poorer when a person with limited English proficiency (LEP) needs but does not get a trained interpreter.[4,5] Trained interpreters are preferred when communicating with LEP patients,[6] resulting in better communication, patient satisfaction, quality of care and health outcomes than using untrained family members or bilingual staff members.[4,5] Although trained interpreters or accompanying family members can be called upon in situations such as taking a full history or obtaining informed consent, they may not be readily available for day-to-day communication, at night or in unplanned encounters. Poor language ability, lack of knowledge of medical terminology, confidentiality, difficulty discussing sensitive issues and family members imposing their own agenda, raise ethical issues relating to family members as interpreters.[7,8]

Translation technology is a rapidly evolving field. In a clinical encounter, a health professional faced with a language barrier and no other help available at the time may use an electronic translation tool. *Google Translate* is the most researched web-based translation tool in medical settings, but with mixed results. Performance remains imperfect and accuracy can vary between languages.[9,10] Although feasible in the absence of a trained interpreter,[11] it may not be safe enough for use in settings such as maternity care.[9]

As technology develops, we can expect the accuracy and performance of some tools to improve, as some voice recognition translation systems can produce 97%–100% accuracy.[12] Computer-based tools designed for specific situations have produced more positive results, for example, an app containing pre-recorded Chinese audio translations of routine sayings in anaesthesia was played to 25 Chinese women during labour.[13] Patient comprehension and satisfaction were high enough to justify expansion of the process to other LEP Chinese parturient women. A programme used to elicit asthma history in simulated consultations between Somali asthma sufferers and their health care providers had high satisfaction rates.[14] In contrast, a phrase book of medical terms and activities could be easier to use, more useful than translation tools, and better aligned to brief interactions in the medical context.

Since little is known about the attitudes and concerns of doctors and nurses in using electronic translation tools or phrase books for direct patient–clinician communication, we evaluated an app called Listen Please to gain insight into its potential uses in a clinical setting, using the updated Technology Acceptance Model2 (TAM2)[15] as a framework.

METHODS

The translation app

An intensivist clinician saw an unmet need in an Intensive Care Unit of an urban hospital, where patients and clinicians needed less than an interpreter but more than gestures, miming and family members, to assist with brief interactions.[16] A phrase book app was designed for brief interactions and is not a substitute for a trained interpreter.

The app includes the most commonly spoken South East Asian and Pacific languages in the North Island, NZ, that is, written and vocal translations and accompanying graphics in Cantonese, Mandarin, Samoan, Tongan and Korean. It pairs 400 English phrases commonly used in interactions between patients and their clinicians. The translations were done by trained interpreters to ensure accuracy. Graphics were designed to avoid cultural offence. The app, available on an iPad, provides interpretations of standard medical information, from the clinician's and patient's points of view, as illustrated in Figure 1. Patients can also express aspects of daily life dialogue. The questions are phrased to elicit 'yes' or 'no' or 'don't know' answers using the touchscreen. For those who are unable to respond by touching the device, there are vocal instructions that instruct the patient to nod, shake their head side-to-side or shrug their shoulders.

The participants

Doctors and nurses from a range of specialities and clinical experience were recruited from one urban hospital. They were recruited by an independent research advisor based in the hospital and referred to the researcher to make an appointment for an interview once informed consent was gained. Ethical approval for the study was gained from University of Auckland Human Participants Ethics Committee (ref 013220). We aimed for an equal number of doctors and nurses, a diverse cross section of clinical experience and speciality, and enough interviews to achieve saturation (i.e. no new content emerging in subsequent interviews).[17] Fifteen clinicians were interviewed. The iPad was carried in a waterproof case to enable decontamination between interviews.
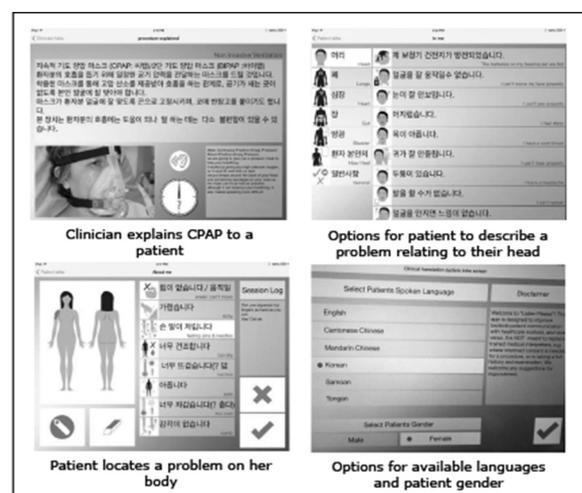

Figure 1 Screenshots illustrating the app's functionality

The interview

The language used in the study was Korean as the interviewer was bilingual in both Korean and English. During the interview, data was gathered by means of a three-step process once informed consent was obtained.

1) The app was demonstrated and participants were invited to browse and explore it at the beginning of the interview.

2) A simulated vignette incorporating a typical scenario was presented. Interviewees were asked to determine whether the situation was an acute emergency or not and understand the patient's non-clinical needs. The interviewer played the patient's role in Korean.
   Vignette: A 30-year-old Korean woman is admitted to hospital for pneumonia five weeks after the birth of her healthy baby boy. She does not speak any English, and she has pain in the lower chest/upper abdominal area. She is distressed and wants to desperately see her partner and baby.

3) Eight semi-structured questions, based on the TAM2, were asked (Table 1). The app was available for the participant to use.

The TAM2 model is used to predict acceptance of health information technology with specific reference to ease of use, perceived usefulness and social influence on intention to use[15] (Table 1). Even though the model was not developed specifically for the health care context, a methodological review by Holden and Karsh,[15] which analysed 16 data sets quantitatively testing relationships between variables specified by TAM, showed that the model could predict the use or acceptance of health information technology amongst clinicians.

An audio recording of each interview was made and transcribed by the interviewer. The data was exported to Microsoft Excel 2010, and following familiarization with the data, a thematic coding schedule was developed within the TAM2 framework, based on Muller's five stages of thematic analysis.[18]

Findings

The participants

Of the 15 people interviewed, there were 11 females and 9 interviewees with more than 10 years' experience (Table 2). The eight nurses were female, and seven had more than 10 years' experience. In contrast, only three doctors were female and the two medical consultants had more than 10 years' experience. The hierarchy of nurses and doctors was represented in terms of two tiers of nurses and three for doctors.

A first pass analysis of the interviews in Table 3 shows consensus that a translation app for brief interactions may have a place in a clinical setting.

Perceived ease of use

The majority of participants found the app easy to use, saying it was 'straightforward', 'simple', 'self-explanatory', and 'clear'. Its simplicity and user-friendliness made navigation straightforward. Three self-proclaimed visual learners said that the pictures and diagrams aided navigation. Although some participants commented favourably on how the app was organized into relevant sections and subsections, others found it confusing and hard to find phrases in the absence of a search facility. All were able to use the app, and half commented that with practice the app would become easy to use. All participants indicated that the app would be easy to learn to use and memorize because of its simplicity.

Perceived usefulness

All but one participant indicated that the app may be useful in their job. Seven participants indicated the boundary between the app's purpose and the purpose of interpreters, saying

Table 1 Operationalisation of the semi-structured interview

Variables tested	Recommendations from Holden and Karsh[15]	Semi-structured interview questions
Perceived ease of use	Specific reference to three dimensions of usability: effort, learnability and memorability.	1. How easy or hard was it using the app?
		2. How easy or hard do you think it will be to learn to use the app?
		3. Do you think it will be easy or hard to remember how the app works the next time you use it?
Perceived usefulness	Specific reference to usefulness as gains in personal performance or benefits for patients.	4. How useful do you think this app might be in what you do?
		5. How useful do you think this app might be for your patients?
Perceived subjective norm	In order to acknowledge how social influence can indirectly be exerted on IT use, we asked how direct and indirect social norm may influence how the participant uses the app.	6. Do you think that support from hospital and management will influence how you use this app?
		7. Do you think that your colleagues will be interested in this app?
		8. Do you think that how your colleagues react to this app will influence how you use this app?

Table 2 Demographics of interviewees (_n_ = 15)

Occupation	Female	Male	Work experience <10 years	Work experience >10 years
Registered Nurse	4	0	1	3
Nurse Specialist	4	0	0	4
House Officer	2	1	3	0
Registrar	1	1	2	0
Consultant	0	2	0	2
Totals	11	4	6	9

that it should augment rather than replace the work of interpreters. It could be useful in situations that did not merit an interpreter, for example, brief everyday interactions.

'I think that it is a very useful quick tool to check every day-to-day things like whether the pain medication has worked'.

Six participants described the need to gather information urgently to aid decision-making when no other translation help is readily available. An intensive nurse specialist described the imperative of being able to elicit information in rapidly deteriorating patients.

'I'm trying to get quick rapid answers as to why their condition is deteriorating … find out about the patient's symptoms and what they are feeling to why they are in shock or why they are in pain or why they are deteriorating and be able to ask questions about their body, and have a direct answer will be very useful.'

A translation app like Listen Please appears to bridge a communication gap that exists in any clinical setting. This was illustrated by a nurse specialist who said, 'I don't have to try and figure everything out of nothing', and another nurse saying that she would not have to 'mime and play charades' to communicate with her patients. The app was useful because it aided translation of precise medical terminologies that are otherwise difficult to translate to patients or through family members.

Although most of the participants interviewed were positive in their feedback, a registrar and a consultant raised concerns that an app like this would be too time-consuming if used while examining an acutely ill patient. In contrast, a nurse noted that communication with a deteriorating patient can be facilitated because there is no need to wait for an interpreter.

All participants indicated that the app may be beneficial for patients. The most common reasons were that it could: (1) aid patients to express basic medical concerns or daily life communication, (2) facilitate explanations of clinical procedures to patients in their own language with accompanying diagrams that gave a good idea of what was involved, (3) reduce patient isolation, discomfort, pain and frustration. Communication using the app is interactive, as the patient can read, hear and reply, and express their own concerns by initiating an interaction.

Social norm

All but one participant indicated that their colleagues would react positively to using an app similar to Listen Please, subject to perceived usefulness, ease of use and perceived computer literacy. Several participants voiced concerns about the computer literacy of both older generation patients and health professionals.

'We have a patient satisfaction survey that we are doing on an iPad and some of the elderly patients actually find it a bit challenging and they don't want to do it … We can get quite elderly patients in their 70s or 80s so I'm not sure how they would feel using this but I am sure with family members and nurses and doctors, it is quite simple and self-explanatory'.

The influence of others on their use of the app was mixed. Wide social acceptance and approval may normalize its use. One participant required a team decision to making the app available for regular use, while nine indicated that management support would be influential, especially in light of the need for installation and updates. Ten participants stated that their own use of the app will be independent of others' opinions, subject to the value it adds to their work. Six felt that management support was not needed, subject to the app being useful.

Three participants commented on changing social norms, observing that in the technological 21st century it is normal for clinicians to own smartphones and hospitals to become digital. Because downloading and experimenting with new

Table 3 Quantified interview results in the TAM2 framework

Condition of acceptance	Characteristic	Result (n = 15)
Perceived ease of use	The app was easy to use	14
	The app was easy to learn	15
	The app should be easy to memorize	15
Perceived usefulness	The app may be useful for my job	14
	The app may be useful for my patients	14
Social norm	My colleagues may be interested in using an app similar to this	14
	The way my colleagues view an app like this is important to me	5
	Support from the hospital and management is important to me	9

technology is more accessible, people are able to choose and use whatever useful app they find, thus making approval or support from management, hospitals or peers, redundant.

Need for a new approach

The interviewees revealed a need for a fresh approach to addressing language barriers. Ten participants observed that conversations with LEP patients were becoming more common. They expressed how these conversations generally required effort and time, created feelings of guilt and frustration, and resulted in limited medical history and information taking. Seven participants described situations where obtaining a trained interpreter was difficult, including at night time, acutely ill patients, and brief daily situations that do not merit booking a trained interpreter.

Participants described reliance on family members or bilingual staff members, and if not available, they attempted to get by through improvisation. Two participants were concerned about using family interpreters resulting in inaccurate translations and putting pressure on family members who may be stressed. Commonly available hard copy flash cards with translated words and phrases were limited, difficult to use, and often went missing.

Concerns and caveats

The most common concern was too few phrases. This could limit the use of the app to simple, stereotypical presentations and situations and could result in oversimplification in the absence of a best match for what they wanted to say.

> 'If I ask, 'Have you travelled anywhere in the past six months?' and the patient says, 'Yes', the next thing I would want to ask is, 'Where did you travel?' which I can't do ….'

The app does not enable the doctor or nurse to indicate their understanding of a patient's concern. The ability to acknowledge and reassure was important for three participants. According to two participants, a patient's physical impairment (e.g. vision loss) may mean that it is impractical to interact using an iPad. Although the screen is large enough for users to easily read text or enter answers and the volume can be maximised, it is uncertain if this is sufficient.

DISCUSSION

Key findings

We aimed to gain insight into attitudes and concerns of clinicians regarding a translation app for use in brief interactions with hospitalised patients who do not speak English, using TAM2 as a framework. The key findings show that the app is easy to use, learn to use and to memorise for future use. It was considered useful for everyday brief interactions and urgent situations (e.g. acutely deteriorating patient) where there is no time to wait for an interpreter and, after hours, to augment the work of interpreters. Subject to perceived usefulness, there appears to be little need for social normalisation of a translation app, other than management support for the costs, maintenance and implementation of the app for everyday use.

Implications of the findings

Acceptance of the app depends on its perceived usefulness. A paradox emerged in which time required to use the app was considered a constraint, while the need to communicate with, for example, a deteriorating patient required immediate translation and, therefore, the app's use. The latter time constraint is why trained interpreters are underutilised.[19] Clinicians get by with the ability to leverage the (imperfect) translation skills of bilingual colleagues and patients' family. Unless a translation app's perceived usefulness and ease of use surpass this informal resource, the app is at risk of being as underutilised as interpreters and the hard copy flash cards. Clear guidelines are available on how and when to call an interpreter.[20] New guidelines should clarify the use of a translation app in the absence of an interpreter.

Concerns include older clinicians' and patients' acceptance of and ability to use the technology. There appears to be a stereotype in which older people, clinicians and patients alike are perceived as being technophobic and lacking IT skills. Contrary to the stereotype, older people are the fastest group of technology adopters, and their adoption is linked to ease of use and perceived usefulness.[21] Chau and Hu point out that doctors have a higher intellectual capacity and, therefore, a greater ability to operate technology regardless of age.[22] Developers of medical translation tools assume that clinicians should be the leaders and controllers of the dialogue.[14] Listen Please was designed for co-use by patients and clinicians, enabling patient-led conversation. Our findings suggest that in order to increase health IT acceptance, stereotypes that underestimate older users' potential as technology users, should be challenged.

Some improvements to the app were recommended. They included: (1) more languages, especially uncommon ones, (2) more phrases and the ability to delve deeper once a question has been answered, (3) a search facility, and (4) the ability to acknowledge that a patient has been heard with, for example, 'I understand'. Additional features should focus on mastering the imperfections that put users at risk, for example, inaccurate translations, rather than the scope of functionality. A translation app should be easy and quick to use.[23] Older people should receive training and support for sustained use even when the technology is easy to use and perceived to be useful.[21]

Limitations

This was a small exploratory study consisting of 15 semi-structured interviews with clinicians and framed by TAM2, limited to one clinical scenario using one language (Korean). To achieve rigour, we interviewed clinicians until saturation was achieved,[17] and the data were analysed according to the TAM2 concepts in which topics were identified in the responses to each set of questions associated with each TAM2 construct.

CONCLUSION

We established that for almost all those interviewed a translation app for brief communication interactions in a hospital setting was perceived to be useful (and an adjunct to interpreters), easy to use, and did not require formal social normalisation

for its adoption other than managerial support for costs, future development of recommended feature improvements, and implementation. Future research includes more languages and interview scenarios to build a deeper understanding of the role of the app. Patients were not given an opportunity to contribute to the research and will be prioritised in future research, subject to appropriate safety and privacy considerations.

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