

eCHAT for Lifestyle and Mental Health Screening in Primary Care

Felicity Goodyear-Smith, MBChB,
MD, FRNZCGP

Jim Warren, PhD

Minja Bojic

Angela Chong, BBus, RGN

Department of General Practice & Primary
Health Care, Faculty of Medicine & Health
Science, University of Auckland, New
Zealand



ABSTRACT

PURPOSE Early detection and management of unhealthy behaviors and mental health issues in primary care has the potential to prevent or ameliorate many chronic diseases and increase patients' well-being. This study aimed to assess the feasibility and acceptability of the systematic use of a Web-based eCHAT (electronic Case-finding and Help Assessment Tool) screening patients for problematic drinking, smoking, and other drug use, gambling, exposure to abuse, anxiety, depression, anger control, and physical inactivity, and whether they want help with these issues. Patients self-administered eCHAT on an iPad in the waiting room and received summarized results, including relevant scores and interpretations, which could be accessed by a family physician on the website and in the electronic health record (EHR) at the point of care.

METHODS We conducted a mixed method feasibility and acceptability study in 2 general practices in Auckland, New Zealand. Participants were consecutive adult patients attending the practice during a 2-week period, as well as all practice staff. Patients completed eCHAT, doctors accessed the summarized reports. Outcome measures were patients' responses to eCHAT, and patients' written and staff recorded interview feedback.

RESULTS Of the 233 invited patients, 196 (84%) completed eCHAT and received feedback. Domains where patients wanted immediate help were anxiety (9%), depression (7%), physical activity (6%), and smoking (5%), which was not overwhelming for physicians to address. Most patients found the iPad easy to use, and the questions easy to understand and appropriate; they did not object to questions. Feedback from 7 doctors, 2 practice managers, 4 nurses, and 5 receptionists was generally positive. Practices continue to use eCHAT regularly since the research was completed.

CONCLUSIONS eCHAT is an acceptable and feasible means of systemic screening patients for unhealthy behaviors and negative mood states and is easily integrated into the primary care electronic health record.

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INTRODUCTION

Unhealthy behaviors and mental health issues are major contributors to the burden of chronic disease suffered by many primary care patients. Early detection and helping patients in self-management can assist in primary and secondary prevention.

We developed the paper-based CHAT (Case-finding and Help Assessment Tool) for systematic assessment of lifestyle risk factors (smoking, problematic drinking, other drug use, gambling, exposure to abuse, physical inactivity) and mental health issues (depression, anxiety, anger control), which we evaluated in a number of primary care and community settings,¹⁻⁴ and validated against a composite reference standard.⁵ A key component of CHAT is the help question, which asks patients whether they would like help, either during this visit or at a later date. This patient-centered approach facilitates shared decision making and self-management. We have shown that the help question significantly improves the specificity of the test.⁶⁻⁸

Conflicts of interest: authors report none.

CORRESPONDING AUTHOR

Felicity Goodyear-Smith, MBChB, MD,
FRNZCGP

Department of General Practice & Primary
Health Care
Faculty of Medicine & Health Science
University of Auckland
PB 92019 Auckland, New Zealand
f.goodyear-smith@auckland.ac.nz

We subsequently developed an electronic version (eCHAT) to be used on a touch screen computer kiosk in the waiting room of a family practice. During a feasibility and acceptability study, most patients found the touch screen easy to use and the eCHAT questions clearly phrased and easy to understand, and that there were minimal objections to the questions being asked and minimal concerns about privacy with the process.⁹ This version was integrated directly into 1 of the 4 main electronic health records (EHRs) used by New Zealand family physicians; however, we decided a Web-based version would be more flexible.

The current eCHAT is self-administered on a tablet computer (eg, an iPad) in the waiting room, and the summarized results, including relevant scores and interpretations, where available, can be accessed by the family physician on the website and then downloaded into the EHR at the point-of-care. The clinicians have the choice of reading the summarized reports off the website, cutting and pasting these into the clinical notes, or clicking a button to load results into the EHR, entered in the screening and diagnosis fields. A red alert is provided if the patient's responses are positive for self-harm.

The digital nature of eCHAT allows for additional tools to be completed where relevant. If patients respond positively to the smoking, drinking, or other drug questions, they are administered the relevant World Health Organization Alcohol, Smoking and Substance Involvement Screening Test (ASSIST),¹⁰ and their responses scored and interpreted and provided in the clinician's summary. Similarly, positive answers to the depression and anxiety questions trigger the Patient Health Questionnaire for Depression (PHQ-9)¹¹ and the Generalized Anxiety Disorder Assessment (GAD-7),¹² respectively. The help question is asked after positive responses in any of the 9 domains. The CHAT is available as an online Supplemental Appendix in the *Annals of Family Medicine* (http://www.annfammed.org/content/suppl/2009/05/07/7.3.239.DC1/Goodyear-Smith_Supp_App.pdf) and the added tools (ASSIST, PHQ-9 and GAD-7) are in the public domain.

There is support in North America for such a tool. A recent US study identified support by stakeholders, including primary health care clinicians and patients of patient-reported data reflecting health behaviors and psychosocial issues being included in the EHR.¹³ Krist et al identify that information about health behaviors could be one of the most appropriate types of information provided by patients through a patient-centered personal health record portal.¹⁴ A study of standardized, brief practical health behavior (diet, physical activity, smoking, alcohol consumption) measures used across 7 practice-based research networks found modest improvements after interven-

tion but concluded variations in implementation and instrumentation performance needed attention, which eCHAT would address.¹⁵

Primary care is the arena for improving population health. Barbara Starfield made the case that family physicians must be in the forefront of health care reform.¹⁶ She identified that primary health care needs to be accessible, person-focused over time, comprehensive, and coordinated.¹⁷ This approach is in line with the development of the patient-centered medical home, defined as "an approach to providing comprehensive primary care...that facilitates partnerships between individual patients and their personal providers and, when appropriate, the patient's family."¹⁸⁻²⁰ The 2010 Patient Protection and Affordable Care Act seeks to strengthen the primary care foundation in the United States through the use of innovative delivery models, such as the patient-centered medical home,²¹ based on the following principles:

- Patients having an on-going relationship with a personal physician trained to provide first-contact, continuous and comprehensive care
- A physician-led practice team approach; a whole person orientation with the personal physician responsible for providing for all the patient's health care needs or arranging appropriate care with other professionals
- Coordinated and/or integrated care across specialists, hospitals, and community agencies
- Quality and safety assurance by a care planning process, evidence-based medicine, clinical decision-support tools, performance measurement, active participation of patients in decision making, information technology, quality improvement activities, and other measures
- Enhanced access to care, such as new options for patient-clinician communication

eCHAT facilitates development of the patient-centered medical home. Because information is collected, analyzed automatically, and transferred seamlessly to EHR in real time to be accessed by the clinician, it is an efficient and cost-effective way of assessing some of patients' major lifestyle health risks. The time needed to identify problematic lifestyle behaviors and mental health issues is reduced, because eCHAT can be self-administered in the waiting room before the visit. It further minimizes the chance of missing opportunities to provide early health care. eCHAT puts the patient, not the disease, in the center with a whole-person orientation. The questions on the eCHAT application greatly enhance the potential for clinicians to accurately identify patients' needs around such sensitive mental health issues as depression, domestic violence, and alcohol or illicit drug use.

Our aim for this study was to assess the feasibility of the systematic use of the Web-based eCHAT self-administered by patients in the waiting room, with summarized results accessed by family physicians during the ensuing visit, and to gauge the acceptability of this tool by patients, physicians, and other practice staff.

METHODS

Our study setting was 2 family practices in Auckland, New Zealand, between November 2011 and February 2012. Neither of the 2 practices had previously participated in CHAT or eCHAT research. They were selected because one had a particular interest in mental health issues and a patient profile of a relatively high socioeconomic status, and the other was in a relatively deprived neighborhood with a large number of patients who had substance misuse issues. In both practices over a 2- to 3-week period, the research assistant approached consecutive adult patients (aged 16 years and older) in the waiting room and invited them to participate in the study. Exclusion criteria included inability to communicate in English, impaired mental status (such as dementia) to the extent that they could not meaningfully participate, and previous recruitment in the study. Consenting patients self-administered the eCHAT on an iPad. During their consultation, their family physician had access to their responses and relevant scores, using the eCHAT Web-based report followed by the option to download outcomes into the EHR.

Although the demographic characteristics of individual patients were not collected, the practices differed with respect to socioeconomic status, and enrollment by consecutive patients is likely to have meant that they represented the overall demographic of the practice population.

We used a multistrand mixed method (quantitative and qualitative) study design. We collated anonymized eCHAT responses from recruited patients extracted from the eCHAT database on the website. After the consultation, the patient completed a feedback form with both quantitative (yes/no) and free-text responses (see the Supplemental Appendix at <http://annfammed.org/content/11/5/460/suppl/DC1> for questions).

At the end of patient data collection from each practice, the research assistant invited all staff to participate in face-to-face, audio-recorded semistructured interviews, which were then transcribed.

We analyzed quantitative data using descriptive statistics. Two researchers read and re-read qualitative data to identify themes, which they then independently coded; the few discrepancies were resolved through adjudication.

Ethical approval was obtained from the Auckland Northern Y Regional Ethics Committee (reference NTY/11/10/102). Subsequent to the study phase both practices continue to implement eCHAT screening with their patients.

RESULTS

In total, 233 patients were invited to participate (practice A = 127; practice B = 106) of whom 211 consented, for a 91% response rate, and 196 patients both completed the eCHAT and provided feedback on the

Table 1. Nonrespondents From 233 Invited Participants

Characteristic	No. (%)
Total nonrespondents	37 (15)
Declined, and reasons for declining	22 (9)
"Did not feel like it"/"Can't be bothered"	4
Felt too sick	4
Doctor already has this information	2
Vision problems	2
No reason given	2
Not at the doctors to talk about self—coming in regarding a family member	1
Possible chickenpox infection—not wanting to touch iPad because might be infectious	1
Because of their condition	1
Too busy	1
Data utilization concerns	1
Not interested in at the moment but thinks it is a good idea	1
Did not want to discuss drug use with doctor	1
Not comfortable with information technology, iPad	1
Completed eCHAT, but time restraints prevented feedback	15 (6)

Table 2. eCHAT Responses

eCHAT Domains	Responses No.	Positive Score No. (%)	Help Question Responses		
			No	Yes, But Not Today	Yes
Smoking	196	29 (15) ^a	7	12	10
Drinking	196	63 (32) ^a	59	1	3
Drugs	195	6 (3) ^a	3	1	4
Gambling	187	2 (1)	2	—	—
Depression	187	29 (16) ^a	11	4	14
Anxiety	185	53 (29) ^a	30	6	17
Abuse	184	19 (10)	16	2	1
Anger	182	20 (11)	15	2	3
Exercise	181	75 (41)	58	6	11

ASSIST = Alcohol, Smoking and Substance Involvement Screening Test; GAD-7 = Generalized Anxiety Disorder Assessment; PHQ-9 = Patient Health Questionnaire for Depression.

^a Added tool (ASSIST, PHQ-9 or GAD-7) completed.

Table 3. Quantitative Feedback From Patients

Question	Responses No.	Responded Yes No. (%)
Did you find the iPad easy to use?	193	188 (97)
Did you find all the questions clearly phrased and easy to understand?	195	176 (90)
Do you think that this is an appropriate thing for your family doctor to be offering?	188	175 (93)
Are there any questions you object to being asked?	192	7 (4)
Did you have any concerns about privacy with the process?	177	16 (9)

tool (84% of the invited sample) (Table 1). Attrition was due mainly to time constraints, with the research assistant unable to collect the feedback from every patient immediately after their visit with their doctor. Reasons that 22 patients declined to participate are shown in Table 1.

The responses patients gave to eCHAT are recorded in Table 2. The top domains where patients wanted immediate help were anxiety (9%), depression (7%), physical activity (6%), and smoking (5%), which their doctors did not find overwhelming. No patient wanted help during the consultation with more than one issue.

Table 4. Thematic Analysis of Patient Feedback

Theme	Examples
What if anything did you like about the questionnaire?	
Easy to use	"Easy to follow. Didn't take very long. Very easy to use" (Patient [P]016). "That I can answer quickly and directly" (P056)! "Easy to use and understand. Not very time consuming" (P048)
Helpful for doctor and for doctor-patient relationship	"It seems quite personal, which is always good for a doctor-patient relationship" (P028). "Could be honest about things might not want to say to the doctor" (P087). "Using the iPad is not as (potentially) intimidating as talking to someone face to face regarding personal mental health/abuse" (P062). "Raising few issues which not necessarily discussed in normal consultation—opens the door to discussions with doctor" (P031).
Liked nature of the questions	"It asked questions about abuse. I think this is an easier way to let the doctor know if something is wrong at home. Very simple but effective" (P073). "It asks a lot of different questions about life" (P025). "Clearly aimed at identifying lifestyle issues" (P096).
Good use of waiting time	"The questions before entering doctors" (P073). "Feels effective to collect data while waiting" (P061).
Helps self-reflection	"Interesting. Good to have a look at self" (P109).
Is there anything you think could be improved?	
Nature of the questions	"The options are slightly limiting" (P021). "Not sure people with problems would give truthful answers. Possible rephrase questions to be a little more subtle" (P096). "No grey areas. My circumstances aren't the 'norm'—I'm a victim of bizarre circumstances therefore needed other options apart from yes/no" (P038).
Additional questions	"Could ask a question about sexual problems/issues" (P081). "More questions on lifestyle, exercise, diet" (P017). "Could have provided an 'other' option to provide comments as some of the answers available weren't suited to how I wanted to respond" (P014).
Issues about the iPad	"Fragility, could have handles" (P037). "Offer pen/paper multi choice" (P085). "Cleaning the iPad—lots of fingerprints" (P047).
Do you think this is an appropriate thing for your doctor to offer?	
People may be more forthcoming on iPad	"Maybe get better feedback from questionnaire than patient telling doctor" (P029). "Because you don't have to answer the questions to them directly" (P042). "Sometimes in certain circumstances the person may not answer the questions truthfully if asked in person" (P108).
Efficient way of doctor finding out about patient	"Because you may pick up problems/potential problems that the patient may not have brought up" (P102)! "It takes less work off them but gives them a good understanding of each patient" (P104). "Because it's a record of your well-being/shows they actually care (P015). "Self-screening, prior to appointment—great idea" (P009).
Privacy and security concerns	"I don't like the idea of the answers being on record for anyone to see, eg, insurance companies" (P078). "Because it's done online it may not be secure" (P018).
Invasive questions	"Was invasive and was not particularly comfortable doing it. Not what I came in for" (P020).

Most patients found eCHAT easy to use and did not object to the questions (Table 3). Themes derived from their qualitative responses are presented in Table 4. Although the majority were very positive about their eCHAT experience, a couple of patients expressed concerns about the security of Web-based data or the implications should their insurance company request this information. There was no significant difference (Fisher's exact 0.09), however, when comparing the number of positive eCHAT domains in the total participant group and those who did not answer the privacy question with those who had privacy concerns (Table 5).

Practice A staff consisted of 4 family physicians, 2 nurses, 3 receptionists, and 1 practice manager.

Practice B had 3 family physicians, 1 practice manager, and 2 nurses who also served as receptionists. Table 6 records the major emerging themes with examples from the 16 audio-recorded and transcribed staff interviews. In general, staff found the tool to be simple, quick, and easy to use; they liked the way their patients were screened; they valued the way it facilitated patient engagement; and they appreciated the way it integrated with the EHR at the point of care. A concern about insurance companies having access to eCHAT reports was raised by 1 doctor who chose not to download the results into the EHR for this reason. Although some staff believed it saved them time, others saw that it could lead to an extended consultation

on occasion in the short-term, but in the longer term it was an efficient way of finding out and addressing patient needs. All 7 family physicians agreed that eCHAT could contribute to patient understanding in relation to their risky health behaviors or mental health issues through various interventions and self-management.

Table 5. Number of eCHAT Domains Positive for All Participants and Those Concerned About Privacy Issues

	eCHAT Domains Positive, No. (%)							Total
	0	1	2	3	4	5	6	
All participants	46 (23)	63 (32)	55 (28)	16 (8)	7 (4)	8 (4)	1 (1)	196 (100)
Concerned about privacy issues	1 (6)	6 (38)	7 (44)	2 (12)	0 (0)	0 (0)	0 (0)	16 (100)
Privacy issues blank or unsure	4 (21)	5 (33)	8 (53)	1 (7)	0 (0)	1 (7)	0 (0)	19 (100)

Table 6. Thematic Analysis of Staff Feedback

Theme	Examples
What if anything did you like about eCHAT?	
Easy to use	"It's quite simplistic, it's straightforward, patients are responding very well to it" (Receptionist [R]01).
Electronic integration helpful	"Very easy to upload into the [EHR]" (Family physician [FP]01). "No forms to fill in" (R05). "As opposed to a written form, is that it's straight in the notes" (Nurse [N]01).
Valuable screening	"eCHAT system has allowed me to pick up occasionally on some aspects of a person's behavior or illnesses which I probably wouldn't have otherwise picked up on that day" (FP04). "I like the potential it has to help people to disclose symptoms that they mightn't be able to tell me in the consultation" (FP03). "Patients find it easy to disclose problems on the eCHAT which they wouldn't have necessarily have brought up" (FP02). "Fast, productive method of getting screening. Which helps us do a lot of our programs, and know more about the people" (N01).
Contribute positively to time with patients	"...because it cuts to the chase and it means the problem is there on the table right at the start of the consultation" (FP01). "It was seamless and a very efficient way of collecting information. The questions therefore are very important but the time spent was absolutely worthwhile it was a very efficient use of time" (FP02). "It couldn't be more efficient, a lot of that information...if you tried to extract it yourself in the course of the consultation it would just blow out hideously, you couldn't do it. And so, of course, often we don't, and you just tend to fancy that you, you know, acquire that information or if it's relevant you think you know it but sometimes you do and sometimes you don't. I think it's really plugging some really important holes and it's going to have a real efficiency to what we're doing in terms of...getting people's important underlying problems to the surface sooner rather than later" (FP03). "In a sense creates more work, but that's what we're here for" (FP04).
Is there anything you think could be improved?	
Concerns about insurance company access	"The insurance companies now have access to our notes...it asks 'have you taken drugs', and I know that the insurance companies are very interested in that, and I don't know how selective they may be in 5 or 10 years' time" (FP05).
Electronic notification	"An alert on the patient's file that it has been done" (R05).
Font size	"He said he couldn't see it very well, he had to go and get his reading glasses, so maybe a bit bigger writing, brighter" (R03)?
Provision of additional services	"Funding. Because a lot of the issues that it's going to tap into are ones that are going to require extended mental health type consultations and in some instances referral to clinical psychologists" (FP03).

DISCUSSION

eCHAT was found to be an acceptable method of implementing systematic lifestyle and mental health screening in patients to general practice. With a more than 90% response rate, eCHAT screening is an effective means of identifying, managing, and documenting these issues. The help question further empowers patients to control the direction of their consultation. Evidence indicates that when a patient identifies an issue as a problem, it is more likely to be solved than when it is identified by their health care clinician.^{22,23}

eCHAT screening offers an opportunity to improve documentation of lifestyle and mental health issues. For instance, it was found previously that New Zealand general practice EHRs had smoking status recorded for less than 50% of adults,²⁴ a rate can be improved through routine use of eCHAT. Interoperability of eCHAT with the EHR also allows for improved clinical coding, whereas without such a system many of the eCHAT areas, even if addressed, would be likely to be recorded only as free-text notes.

The potential for improved coding, however, has not gone unnoticed by patients and staff, both of whom raised concerns with respect to future access to the information, particularly by insurance companies. The concerns parallel issues arising with the increasing documentation of genomic data and how this recording in the clinical notes may affect patients' future equity of health care access.^{25,26} Such concerns may be difficult to alleviate: in the United States, where 17 months after introduction of the Genetic Information Nondiscrimination Act of 2008 (GINA) it was found that physicians were only patchily aware of its protections, and awareness did not alleviate physician concerns regarding the risk of genetic discrimination.²⁷ The collection, however, of lifestyle and mental health data that is worrying some patients and staff is already an issue intrinsic in the EHR; the systematic approach using eCHAT only brings this latent issue into sharper focus.

Although patients expressing negative feedback and concerns were in the minority, there were a few criticisms of the scope and form of questions, particularly in how such questions as physical activity offered "no grey areas."

Since the research phase, both practices have continued to use eCHAT at a relatively constant rate as part of routine practice during the past year. They are provided with regular feedback about their eCHAT usage. A regular e-mailed activity report logs how many they have conducted each week. One practice is using eCHAT on every adult patient and has averaged 13 per week over 40 weeks. The other practice uses eCHAT on selected patients (for example, all new patients, pregnant, not seen for 1 year, history of

chronic illness, mental illness, or substance misuse) and has averaged 7 per week over 46 weeks.

Strengths and Limitations

Strengths of this study include the high response rate of patients agreeing to participate and feedback data obtained from 196 patients. A limitation is that, because of time constraints, not all consecutive patients who walked into the waiting room were able to be asked to participate in the study by the research assistant. As a result, our selection process was not a systematic way of recruiting patients, which could mean there is some bias in the data. Further, the eCHAT was piloted in 2 volunteer practices, which might not necessarily represent the range either of staffing arrangements, work flows, cultures, and technical configurations or of enthusiasm for such an innovation.

Comparison With Our Previous Study

We conducted a previous, smaller feasibility and acceptability study of a touch-screen (pre-iPad) computer-based eCHAT.⁹ In this current study, we had a larger number of participants with completed feedback forms (196 compared with 50). Results from the 2 studies are similar in that most patients found the iPad or touch-screen computer easy to use and the questions clearly phrased, and they had minimal objection to the questions or concerns about privacy. Our touch-screen study had a higher rate of patients declining to participate (26%), whereas in this iPad study only 9% of patients did not want to complete the eCHAT. The ease of use of the iPad, its increased privacy due to its portability, and the novelty factor may be contributing factors to the lower decline rate.

Implications

From this study we have determined that the eCHAT can be easily incorporated into the family practice environment, as most patients, physicians, and other practice staff find it acceptable for use in this setting, and it is easily integrated into the EHR. The eCHAT is therefore an acceptable tool for systemic finding of cases of unhealthy behaviors and negative mood states in primary care.

Future Developments

Electronic links to stepped-care decision support is now being implemented. This provides for each domain a suite of self-management options (information sheets, help lines, URLs including eTherapies), physician-initiated treatments (brief interventions and medications), referral to community-based agencies, and finally to secondary services. Where patients can access their own EHR and complete eCHAT prior to

presenting for their appointment, they will be able to access self-help and support options themselves and only consult their physician when they require a step-up in intervention.

The question remains as to whether systematic case-finding using eCHAT will lead to improved health outcomes. We propose conducting a clustered randomized trial to determine the effectiveness and cost-effectiveness of systematically detecting and assisting patients to address the 9 eCHAT domains.

To read or post commentaries in response to this article, see it online at <http://www.annfam.org/content/11/5/460>.

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