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## Integrating online communities and social networks with computerised treatment for insomnia:

a qualitative study

### Abstract

#### Background

Insomnia is a common psychological complaint. Cognitive behavioural therapy for insomnia (CBT-I), although effective, is little used because of lack of trained providers. Computerised CBT-I (CCBT-I) may be a solution to this shortfall in access.

#### Aim

To explore patient and health professional perspectives and the role of social networking, to develop a novel CCBT-I programme to increase access to this form of intervention.

#### Design and setting

Qualitative methods underpinned by the theory of planned behaviour in primary care in Lincolnshire and Nottinghamshire.

#### Method

Semi-structured interviews and focus groups with a purposive sample of health professionals and adults with insomnia.

#### Results

A total of 23 health professionals and 28 patients were interviewed. Features designed to engender trust and improve functionality were perceived to improve uptake and adherence to CCBT-I. Trust lay in programme accreditation; for professionals, trust derived from evidence of effectiveness; for patients, trust depended on the doctor-patient relationship, professional support, the quality of online peer support, and perceptions of risk. Patients wanted mobile applications; access in short periods; self-assessment; interactive, personalised information on sleep; and moderated contact with other users. Patients and practitioners differed over whether useful information could be distinguished from less useful or potentially incorrect information.

#### Conclusion

Improving uptake and adherence to online programmes for insomnia requires design features focusing on trust and functionality. Enabling greater patient control and interaction with other users and professionals may stimulate positive experiences of online therapy. CCBT-I would enable greater access to treatment but is limited by lack of online access or poor computer literacy.

#### Keywords

cognitive behaviour therapy for insomnia, computerised; general practice; insomnia; primary health care; social networking.

### INTRODUCTION

Insomnia, the most commonly reported psychological complaint in Britain,<sup>1</sup> is linked to impaired quality of life and increased healthcare use and costs.<sup>2,3</sup>

Hypnotic drug therapy is widely used, despite concerns about its safety and limited evidence of its effectiveness.<sup>4-6</sup> Cognitive behavioural therapy for insomnia (CBT-I) has been shown to be as effective as drugs in the short term,<sup>7</sup> and safer long term for persistent insomnia,<sup>8-12</sup> and for comorbid insomnia associated with anxiety, depression, pain, or cancer.<sup>13-17</sup> Although programmes such as Improving Access to Psychological Therapies (IAPT)<sup>18</sup> now provide better access to non-pharmacological therapies for conditions such as anxiety and depression, CBT-I is not widely used because of lack of trained providers.<sup>19,20</sup>

Computerised cognitive behavioural therapy (CCBT) may be a solution to this access shortfall. CCBT is now a recommended treatment for anxiety and depression, and access to such programmes is increasing in the UK.<sup>21,22</sup> There is also growing evidence for the effectiveness of CCBT for insomnia (CCBT-I),<sup>23-26</sup> despite its limited availability. Furthermore, little is known about potential users' expectations or experiences of such programmes. Existing programmes, while innovative,<sup>27</sup> do not reflect the full range of people's experience of computer technologies, which may include engagement with online

communities and social networks that may increase participation and completion rates for CCBT-I.

While previous research has explored patient and professional attitudes to standard CCBT programmes for common mental health problems,<sup>28-30</sup> no published study has focused specifically on potential user attitudes towards integrating CCBT-I with online communities or social networks; attitudes are an important predictor of treatment intentions in this context.<sup>31,32</sup>

The aim of this study was to investigate patient and professional perspectives, including attitudes, expectations, and beliefs towards any online healthcare programmes that they had used to inform development of a novel CCBT-I platform. More specifically, the researchers aimed to explore participants' preferences for content, style, and how they would negotiate information disclosure to health professionals or fellow insomniacs; identification of factors that would encourage referral, take-up, and adherence; and the effectiveness of a uniquely integrated CCBT-I and social networking application.

### METHOD

A qualitative design was used to collect information from a wide range of purposively sampled professionals and patients. Both semi-structured interviews and focus group methods were used to maximise the breadth and depth of perspectives. Participants

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### How this fits in

Cognitive behavioural therapy for insomnia (CBT-I) has been demonstrated to be an effective treatment for insomnia but is not commonly used. This study shows that adults would be willing to be referred and practitioners would be prepared to refer to an online computerised CBT-I (CCBT-I) package that also includes social networking, provided contact was moderated and it had design features that increased trust and functionality. Results of the study are being used to develop a novel platform for CCBT for insomnia and other health conditions.

were recruited from Lincolnshire and Nottinghamshire, UK. They included patients treated by their GP for insomnia, and potential service users with sleep problems (but for ease of terminology both are referred to as patients in this article). A range of health professionals working with patients affected by sleep problems and insomnia were included. Patients were recruited through posters in public places and family practice waiting rooms, while health professionals were recruited from direct mailing to practitioners or via clinical leaders. A description of the health professionals and patients interviewed is available from the authors.

The patient sample was recruited on the basis of their having sleep problems and differing levels of computer literacy. Additionally, patients who had and had not used CBT and/or CCBT were recruited, to understand more broadly views about the potential of CCBT-I and reduce bias about the focus on a particular (C)CBT programme. Both patients currently seeking treatment and those not currently seeking treatment were included and therefore, because these groups may have been different, the study sought to maximise patient variation and the responses generated. Health professional participants were purposively recruited on the basis of their profession and the length of time they had practised. In addition, those who had and had not facilitated access to CBT and CCBT for patients were recruited to obtain a wide range of responses. The recruitment process was stopped when participants were not providing any new avenues of enquiry, that is data saturation was achieved.

### Interview schedule

A semi-structured topic guide (Appendix 1) was designed to elicit participants'

attitudes, expectations, and beliefs including behavioural intentions and any mediating factors relating to online health care that might facilitate or create barriers to uptake and adherence to CCBT-I. Patients were asked about their sleep problems, how they had tried to solve them, and where they had found useful advice (if indeed they had). Past or current behaviour around using the internet, electronic devices, or applications for health-related matters was explored, to improve understanding of patients' and practitioners' subjective norms, attitudes towards CCBT-I, and beliefs as to whether they would access CCBT-I with a social networking element in the future. Thus, social networking practices were investigated in relation to what, how, and when, users communicated online and any preferences and barriers that were pertinent to them. For professionals, their current treatment for patients presenting with insomnia were explored, as well as their views about both health information online and CCBT.

The theory of planned behaviour was used to inform the topic guide and analytical approach because the theory has been shown to inform design features that will lessen attrition and heighten adherence in CCBT.<sup>33</sup> The theory of planned behaviour proposes that intention to perform a behaviour is an immediate precursor to performing that behaviour and is related to an individual's attitudes and subjective norms (they are expected to engage in the behaviour) and perceived behavioural control (the person is able to engage in the behaviour).<sup>34</sup> Qualitative methods were used to understand participants' beliefs about the outcome of performing the behaviour, about what other people wanted them to do, and about their abilities and the availability of resources that would permit them to go ahead with their health care in relation to CCBT-I and social networking.

All interviews were transcribed verbatim. Interview data were managed using NVivo 8. Thematic analysis was used, and codes and themes were developed iteratively as data were collected.<sup>35</sup> This allowed the researchers to explore new avenues of enquiry during the fieldwork. This process included familiarisation with the data, generating initial descriptive codes, and searching for underlying themes, reflecting deeper notions and conceptualisations.<sup>36,37</sup>

All the codes constructed were data driven (inductive), within a broader framework relative to theory of planned behaviour. The framework consisted of beliefs about and behavioural intentions to use CCBT-I and

any mediating factors that may help design an application suited to the contemporary ways that people access online health care. The process involved three of the authors developing initial codes, two of the authors continuing to code data to generate new codes and potential themes, and three authors reviewing the codes and themes together in an iterative fashion, to generate the final themes and quotes that best illustrated these. Divergent views were actively sought and the different perspectives of the multidisciplinary research team considered during analysis.

## RESULTS

Twenty-eight patients and 23 health professionals were interviewed between January and July 2011 at health premises, the university, or patients' homes. These included: 17 individual and three focus group interviews with patients and eight interviews and three focus groups with professionals.

Two meta-themes emerged from the data: trust and functionality (Box 1). Trust incorporated notions of integrity, assurance, and confidence in the programme. Functionality referred to the range and quality of functions that improved the usability and usefulness of the programme for patients. Trust for both health professionals and patients lay in accreditation of programmes; for professionals, trust also derived from the evidence of effectiveness, whereas for patients, trust depended on the doctor-patient relationship, ongoing professional support and feedback, and the quality of peer support, including perceptions of security and risk.

### Trust

*Trust in the programme.* Most professionals were aware that CBT was recommended, widely promoted, and used for common mental health conditions but GPs wanted firm evidence of effectiveness of CCBT-I to have confidence to refer their patients:

**GP22:** *'I think it's useful to have evidence that it does actually make a difference. Also that there's no evidence of harm or risk.'*

**GP17:** *'Yes if I thought something was useful and I thought that there's reasonable evidence to back it up, then I would feel happier to recommend it and perhaps more confident in suggesting it to people.'* (GP focus group — GP22: GP principal, male; GP17: GP principal, male)

GPs acknowledged that CCBT-I could be a useful treatment option but felt that patients needed to be screened and treated

for mental health problems before referral. Some had referred for CBT or CCBT, with variable experiences. Very few patients with insomnia had an in-depth understanding of what CBT-I was, although some had accessed CBT for other mental health conditions and benefited from it:

*'My sister who suffers a little bit from anxiety as well ... I said "Oh you want to ask your doctor about CBT", and I was trying to explain it to her, and the one thing I found that I couldn't be tangible, I couldn't say "Oh well it gives you this and it gives you that" and I sounded like I was talking about some I dunno, leftist type of alternative therapy which CBT isn't really at all ... it sounded like I was asking her to sort of burn the oils, y'know.'* (patient 26: male aged 35 years)

Additionally, participants felt that CCBT-I should be delivered through accredited, non-commercial organisations:

*'I would want to know a bit more about it. I would want to know about its provenance. I would want to know ... who's created this, is it a commercial organisation, is it a professional health organisation, is it an educational institution, where's it come from? ... I'm not sure I would have faith that my doctor had actually checked out because they might just be passing it on ... How thoroughly do people who recommend it, know it?'* (patient 21: female aged 56 years)

*'If it was accredited by a university or medical college or something like that it would be a good start.'* (GP focus group — GP22: GP principal, male)

*'If there was a direct link from a GP practice, so that means that we've already vetted it and we agreed to it, or if it was something that NICE [National Institute for Health and Clinical Excellence guidance] agreed to.'* (GP focus group — GP22: GP principal, male)

Practitioner enthusiasm, based on trust in the product, was felt to increase referral and uptake:

*'I think if you were enthused about it and when you communicated this to the person your enthusiasm would come out and I think they would be a lot more likely to do it ... I think that's the main difference between me and [another practitioner]. She seemed to have success and I didn't have much success, but she said she really trusted it and she enthused about the thing ... that seemed*

*to be one of the big differences.'* (CMHT 08: psychological wellbeing practitioner, male)

Professional support for specific programmes was also enhanced or lessened by personal knowledge or feedback from patients:

*'Most people haven't liked [x] website because it's very intense. It just takes longer, it's intellectually actually very very challenging, so I think a lot of people just give up. They get fed up of the intellectual effort they have to put into it. ... Just a random survey people just hated [x].'* (GP focus group — GP17: GP principal, male)

*Trust in the patient-professional relationship.* Patients were less likely to feel they were being treated dismissively by being referred to CCBT-I if they trusted the referring GP and if CCBT-I was part of a package of ongoing care:

*'I think if it was a programme like on prescription, go away I'd like you to do this ... and come back and see me. That would be fine because you know that it's continuing care. It's not like off you go and don't come back.'* (patient focus group — patient 22: female aged 43 years)

Patients generally supported the notion of their progress within CCBT-I being fed back to a health professional, particularly those with whom a good relationship already existed.

Some patients wanted to select which information was reported and concerns were raised in relation to continuity of care if patients did not regularly see the same healthcare professional:

*'I think one of the problems with GPs these days is usually you don't see the same GP. I mean I'm in a very modern practice and we're on a carousel so you get whoever comes next and for me to see my GP to talk about my withdrawal plan, I'm going to have to book 2 weeks in advance. That's the reality of modern health care.'* (patient focus group — patient 18: male aged 50 years)

Health professionals were open to receiving information, with their patients' consent, provided that it did not require too much additional work, because they felt that identifying and monitoring patterns of response to treatment might be clinically helpful. Direct access to CCBT-I was an important consideration for those who did not, or chose not to, consult with their GP for insomnia:

*'If you don't see it [insomnia] as a problem, and you haven't gone searching for like medical help or anything ... I tend not to go to the doctors for anything.'* (patient 21: female aged 56 years)

*Trust in online peer support.* Some patients were happy to share their experiences relating to insomnia and communicate with others online. They felt it would be reassuring and decrease their sense of isolation to know that there were other people with the same condition. Others wanted to communicate online but remain completely anonymous or use a pseudonym:

*'Oh it would be nice to have a pseudo-name! ... It's like being in the corner with a bag on my head.'* (patient 10: female aged 66 years)

Fear of not knowing who else was online was a concern for many. Additionally, giving out personal information, which might end up in the wrong hands, or leaving a digital footprint (personal identifiable evidence of having used the site), which might be accessed by others, were concerns:

*'I think I'd be a bit reluctant if I didn't know them. They'd have to be friends ... but I don't know about strangers, and I don't think [husband] would be happy with me talking to strangers in the night or whatever.'* (patient focus group — patient 02: female aged 45 years)

*'I'm very wary of the internet, we leave digital footprints wherever we go and you never know what's going to come back and haunt you and I think the more that you are in a professional working environment the more you need to be careful about what you put online. You've got to keep it within certain parameters.'* (patient 21: female aged 56 years)

Among those who were happy to engage in online chat with others, there was a preference to discuss issues only with people similar to themselves in terms of age or particular condition, for example bereavement or a mental health problem:

*'If your sleep was related to say trauma, or your sleep was related to pain, or bipolar or whatever, it would make sense to have both a general sleep body where you could participate but also go down to the subgroups and maybe get some specific advice. Because I do think you listen to your own group.'* (patient focus group — patient 18: male aged 50 years)

## Box 1. Meta-themes, themes, and subthemes

### Trust

- Trust in the programme
  - Evidence of effectiveness
  - Accredited and non-commercial
  - Professional advocacy
- Trust in the patient-professional relationship
  - Part of the package of care
  - Feedback to professional carers
  - Direct access to online treatment
- Trust in online peer support
  - Sharing information anonymously
  - Information security and stranger danger
  - User homophily
  - Asynchronous preferable to synchronous communication
  - Lurking versus sharing
  - Moderation of posts

### Functionality

- Information needs
- Information formats
- Interactive, individualised, and easily navigable
- Timing

Patients considered asynchronous rather than synchronous communication to be safer, that is posting a note, commenting on a forum, or adding to a thread and ratings others' postings, rather than engaging in online communication in real time:

*'But rather than have it almost real time because that might create more issues than is necessary really. So it would be nice to be able to read somebody's comments that they might have left several hours before.'* (patient 26: male aged 35 years)

Some participants preferred to be 'lurkers', looking at others' online information rather than sharing their own ideas or questions. (A 'lurker' is a person who reads online discussions on a forum/thread or other interactive systems, but rarely or never actively participates or contributes.) Reasons given for this were lack of time, and redundancy or duplication of information:

*'Normally if you do a search you'll find that someone's had the same issue as you, you find out what they've done to rectify those issues and take that information away from it and that's all I needed to do ... in theory I'm not being selfish because it's already out there ... Somebody's already had the issue so there's no point me putting that issue on there again.'* (patient 36: male aged 51 years)

Despite a perceived risk that lay ideas or solutions might be inaccurate, most patients thought they would be able to evaluate online advice appropriately. Health professionals were less convinced:

*'You'd just weigh it up and decide whether to do it ... I don't think there's any advice that anybody is going to post that has not been in the press or wherever. It's certainly going to be something really unusual isn't it?'* (patient focus group — patient 09: female aged 52 years)

*'It could be open to all sorts of things being said and suggested and then patients are going to find it very difficult to sort out what is actually recommended and what isn't.'* (NP18: nurse practitioner, female)

Moderating online CCBT-I was felt to be important. Some suggested that all users could be moderators, while others suggested that users could progress to become moderators. A system with users as moderators supervised by a professional

was also suggested, although participants were unclear how this would work in practice.

#### Functionality

Participants suggested a range of functions and qualities that could improve the usability and usefulness of the programme for patients.

**Information needs.** Some CCBT programmes were perceived to be more user friendly than others, in terms of layout, readability, and complexity:

*'[x] is [a] much easier, user-friendly website. It's easier to read, the fonts are bigger, the flows easier, and I think that's the sort of thing that patients are looking for.'* (GP focus group — GP22: male GP principal)

The study data did not suggest any sex- or age-related differences in responses to potential use of CCBT-I, whereas limited access to computers due to financial constraints, poor computer literacy, or disabilities were considered barriers:

*'... because if you look at some people that do have sleep problems ... it may be that nobody has asked them about their literacy skills, so to actually say go and read this, go and look online, they may not be able to, or they might not be able to read the instructions of what they've got to do. ... Other people might have visual problems. Some people might have hearing problems, so it's very much [an] individual thing.'* (NP18: nurse practitioner, female)

Nonetheless, patients highlighted the need to have accurate, research-based information that was regularly updated:

*'As long as it's got the right information and it's up to date, I don't like it when you go in and click on something and it's 1999 and it's a press release, well we're in 2011 now so ... that's an old bit of news that's on your front page! It's got to be fresh all the time you need someone to keep it fresh all the time.'* (patient 36, male aged 51 years)

Patients wanted to know what the normal sleep pattern was, how theirs compared with the norm, and whether it merited medical attention:

*'I need to know that my sleep pattern was doing more harm than good ... because I think it's not normal, but whether it's within the range of normality or whether it's outside of it. ... I would like to know at*

*what point the medical profession would consider a sleep pattern as something to do something about.'* (patient 21: female aged 56 years)

Completing a sleep diary was seen by patients as a way of identifying a pattern to their sleep problem and recording possible lifestyle causes for which they welcomed personalised feedback. Professionals felt sleep hygiene was valuable and that their patients either did not know about or did not implement this advice, whereas patients felt that they already knew about and had tried sleep hygiene. (Sleep hygiene is a set of behavioural and environmental factors that patients are advised on to help them overcome their insomnia.)

*'Most of them already have a mindset, as soon as you start talking about sleep hygiene being the way to go, they switch off. That may be a prejudice of mine but that's my observation.'* (GP04: salaried GP, male)

*'I've seen a psychologist and gone through sleep hygiene and things but it doesn't really work ... I've tried all the sleep hygiene things, where you go to bed at the same time, get up at the same time and all that, have a milky drink or bath. I've done all that.'* (patient focus group — patient 02: female aged 45 years)

A number of participants wanted information on the causes of insomnia and the drugs available to treat it (prescribed or over the counter). Online lectures and professional advice were also suggested.

**Information formats.** Some patients favoured an audio format with audio-books, relaxation tapes, or music, whereas others preferred a more visual approach, reflecting differences in learning styles:

*'Well I always think, because I don't believe in one particular style dominating an individual's learning capacity ... in terms of stimulation and recall I just think a bit of everything for me personally.'* (patient 40: male 57 years)

Visual formats using photos or animations, games, puzzles, or humorous content were suggested to engage and encourage interactive learning:

*'I'd quite like e-learning to be interactive, so you're doing things along the way rather than just reading so, y'know, having simple puzzles or something, have a picture of a*

*bedroom with various things in it and say which of these things are not conducive to you having a good night's sleep, and so you take out the TV and you take out the radiator being turned up full blast and/or do you want extra curtains or whatever, so things you can click and move and do some simple ... And you get feedback that says maybe you've found five things there and there were 10 there ... or whatever.'* (pharmacist focus group — CP 14: male community pharmacist)

Seeing videos of others with sleep problems sharing their stories was considered helpful:

*'Actually it would good to have a video because you could then see the person, because it would have more of an impact than just reading ... because you feel it worked for so and so and so it could work for me as well.'* (patient focus group — patient 29: female aged 23 years)

Text was the least popular format. Only one patient said they preferred text, whereas many others felt it would be a barrier to engagement. Some participants did not like reading from a screen and others were concerned about problems with reading skills. Participants suggested that text, if used, should be in short blocks and easy to read in both font size and language:

*'I can read a page, and then by the time I've read the other page I've forgotten what the first page said so have to go back again.'* (patient 31: male aged 38 years)

Participants varied in preferences for the level of information detail. Some wanted information to be brief, to the point, and in 'bite sized', easy-to-read chunks with headlines, bullet points, or summaries. Others wanted the opportunity to access more detail if desired.

**Interactive, individualised, and easily navigable.** Patients wanted information input to be interactive, individualised, and easily navigable and gave some examples of how this might work. They wanted to document a sleep diary and lifestyle factors that generated a personalised plan advice and recommendations:

*'Possibly, maybe a custom-built plan for the individual ... inputting individual circumstances it could give them individual feedback or advice, tips, and products you may find helpful. ... So I would like to be*

asked a few things, like what have you had to eat or whatever, how much do you drink, caffeine or whatever, and how much do you smoke and then maybe, a timetable, when to get up when to go to bed, how long you should leave before going to bed after you've eaten or [had a] drink, maybe alcohol or caffeine or smoke.' (patient 15: male aged 20 years)

Patients wanted flexibility to select learning that they felt might be most relevant to them, using a search facility or frequently asked questions. Several patients wanted to access ideas and tips online, ideally via a mobile application, when they could not sleep:

*'If I had sleep app on it [mobile phone], when I can't sleep I can just go on it and it might just help with sleep or something. I might be just scrolling and think, somebody has just said this helps so I'll try it.'* (patient focus group — patient 29: female aged 23 years)

Links signposting patients to other sites were suggested to reduce overcrowding the site and enable users to access more detailed information:

**Timing.** Most users were prepared to access CCBT-I for short periods but not necessarily every day.

For others, time was not an issue; they would spend as long as was needed to get what they needed out of the package, with access being more likely in the evenings:

*'Most people would struggle to concentrate on anything for more than 7 minutes don't they? That's what ITV [TV channel] reckons: 7 minutes between advert programmes, something like that.'* (GP focus group — GP22: male GP principal)

*'Again that's difficult because the time that you spend will be in relation to the amount that you need to know and the amount of information that's available. You would give it the time that you felt it needed, so if it got my interest and I felt I was getting something out of it, I would spend whatever time it took.'* (patient 21: female aged 56 years)

## DISCUSSION

### Summary

Two main themes were identified: trust and functionality. Features designed to increase trust in CCBT-I and improve programme functionality were perceived to increase the likelihood of successful uptake and adherence. Patients were more

likely to accept a credible evidence-based programme for insomnia when referred by a trusted professional as part of ongoing care. Interaction with other users, while perceived to provide mutual support, gave concerns, including fear of others online and information security. Patients wanted mobile applications, access in short periods, self-assessment, and a personalised, interactive approach; they also wanted contact with others to be moderated or overseen.

### Strengths and limitations

The strengths of this study were the exploration of different perspectives, triangulation of data (confirmation of findings from different groups of participants), and divergent case analysis from a wide range of patients and health professionals. This was a multidisciplinary study involving academics from general practice, nursing, sleep science, psychology, social science, and human-computer interactions, affording a range of perspectives.<sup>38</sup> The study recruited from one area of the UK, which may not reflect experiences elsewhere, but the authors are confident that their methods generated conceptual generalisability.<sup>39</sup>

### Comparison with existing literature

Professionals and patients in this study wanted CCBT-I to be accredited, non-commercial, regularly updated, and user friendly. Previous studies have also found health information to be more credible if it is accredited,<sup>40,41</sup> and/or endorsed by government or a reputable organisation.<sup>42</sup> Users have also been shown to be wary of commercial interests and concerned about advertisements or promotional materials.<sup>43</sup>

Individuals wanted CCBT-I to be personalised to their perceived needs, with control over what information they accessed, when, and how. They preferred information in short blocks with visual and audio features rather than just text. Language, clarity, tone, and comprehensibility of information are key presentational considerations but breadth, depth, accuracy, and scientific quality have also been shown to be important for credibility of online health information.<sup>40-44</sup> Good content presentation using a professional design and quality graphics also tend to enhance credibility.<sup>40,41</sup>

Professionals and patients welcomed the opportunity to offer (or be offered) treatment other than a sleep hygiene leaflet or hypnotic drugs.<sup>45,46</sup> Referral for CCBT-I was considered to be more acceptable when existing professional-patient relationships were deemed good and part of a care pathway. Previous research has

found that referral and monitoring by health professionals tends to increase trust,<sup>47</sup> whereas lack of trust in health professionals leads to greater dissatisfaction with services.<sup>48</sup> However, those who did not wish to visit their GP for their insomnia also wanted to be able to access CCBT-I directly.

Interaction with other online CCBT-I users via a social networking interface was felt to provide mutual support, particularly if there were perceived similarities between users (so called 'homophily') and if interactions were moderated. In contrast, there were concerns about privacy or latent 'threats' to personal safety. In one study, '[poor] psychosocial health predicted levels of preference for online social interaction'. This, in turn, predicted negative outcomes associated with problematic internet use,<sup>49</sup> concerns that were not voiced by participants of the present study.

There are notable similarities and differences between online health communities (including those for chronic illness) and social networking sites. Sites such as Facebook tend to foster pre-existing social relationships,<sup>50</sup> where users are more likely to interact regularly with a small number of online friends while passively following the status of a larger number of acquaintances.<sup>51</sup> Online health communities, which link users with common health issues, have been perceived to have greater potential for mutual understanding and support, particularly at times when health professionals are not normally available.<sup>50</sup> Although network ties in online health communities may be weaker, they may be less affected by stigma about the condition and therefore increase opportunities for disclosure.<sup>52</sup>

Known disadvantages of online health support groups include the time required to read others' communication, misinterpretation of posts, and promotion of inaccurate or unorthodox treatments.<sup>53</sup>

Although patients in the present study felt they would be able to distinguish accurate from inaccurate information, health professionals were more doubtful about this.

Users in the present study preferred greater control over interactions through asynchronous rather than real-time responses. Both asynchronous and real-time (synchronous) online communication have advantages and disadvantages. While some users dislike slower feedback, others prefer the convenience of asynchronous communication, as it can be difficult to talk to others because of different time schedules and zones. Multiple users have an opportunity to read and respond to a posting and it may be difficult to find a particular individual online at any one time.<sup>54</sup>

### Implications for practice and research

The rapidly increasing familiarity and use of social networking provides an unprecedented opportunity for health interventions to be delivered via this platform. Internet-delivered interventions with peer-to-peer support are showing positive effects on health outcomes.<sup>55</sup> The findings of this study provide detailed evidence on design features that users suggest may improve uptake and adherence to online health interventions for insomnia and other mental health complaints. Further research is needed to determine whether incorporation of these attributes is associated with increased use, greater adherence, and consequently improved health outcomes.

Improving uptake and adherence to online programmes for insomnia requires design features focusing on trust and functionality. Enabling greater patient control and interaction with other users and professionals may stimulate positive experiences of online therapy. CCBT-I would enable greater access to treatment but is limited by lack of online access or poor computer literacy.

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### Provenance

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### Competing interests

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## REFERENCES

1. Singleton N, Bumpstead R, O'Brien M, *et al.* *Psychiatric morbidity among adults living in private households, 2000*. London: The Stationery Office, 2001.
2. Hayward R, Jordan KP, Croft P. Healthcare use in adults with insomnia: a longitudinal study. *Br J Gen Pract* 2010; **60(574)**: 334–340.
3. Ozminkowski RJ, Wang S, Walsh JK. The direct and indirect costs of untreated insomnia in adults in the United States. *Sleep* 2007; **30(3)**: 263–273.
4. Siriwardena AN, Qureshi MZ, Dyas JV, *et al.* Magic bullets for insomnia? Patients' use and experiences of newer (Z drugs) versus older (benzodiazepine) hypnotics for sleep problems in primary care. *Br J Gen Pract* 2008; **58(551)**: 417–422.
5. Glass J, Lancot KL, Herrmann N, *et al.* Sedative hypnotics in older people with insomnia: meta-analysis of risks and benefits. *BMJ* 2005; **331(7526)**: 1169.
6. Buscemi N, Vandermeer B, Friesen C, *et al.* The efficacy and safety of drug treatments for chronic insomnia in adults: a meta-analysis of RCTs. *J Gen Intern Med* 2007; **22(9)**: 1335–1350.
7. Smith MT, Perlis ML, Park A, *et al.* Comparative meta-analysis of pharmacotherapy and behavior therapy for persistent insomnia. *Am J Psychiatry* 2002; **159(1)**: 5–11.
8. Irwin MR, Cole JC, Nicassio PM. Comparative meta-analysis of behavioral interventions for insomnia and their efficacy in middle-aged adults and in older adults 55+ years of age. *Health Psychol* 2006; **25(1)**: 3–14.
9. Montgomery P, Dennis J. Cognitive behavioural interventions for sleep problems in adults aged 60+. *Cochrane Database Syst Rev* 2003; **(1)**: CD003161.
10. Morin CM, Hauri PJ, Espie CA, *et al.* Nonpharmacologic treatment of chronic insomnia. An American Academy of Sleep Medicine review. *Sleep* 1999; **22(8)**: 1134–1156.
11. Morin CM, Bootzin RR, Buysse DJ, *et al.* Psychological and behavioral treatment of insomnia: update of the recent evidence (1998–2004). *Sleep* 2006; **29(11)**: 1398–1414.
12. Morgan K, Dixon S, Mathers N, *et al.* Psychological treatment for insomnia in the regulation of long-term hypnotic drug use. *Health Technol Assess* 2004; **8(8)**: iii–68.
13. Smith MT, Huang MI, Manber R. Cognitive behavior therapy for chronic insomnia occurring within the context of medical and psychiatric disorders. *Clin Psychol Rev* 2005; **25(5)**: 559–592.
14. Manber R, Edinger JD, Gress JL, *et al.* Cognitive behavioral therapy for insomnia enhances depression outcome in patients with comorbid major depressive disorder and insomnia. *Sleep* 2008; **31(4)**: 489–495.
15. Vitiello MV, Rybarczyk B, Von KM, Stepanski EJ. Cognitive behavioral therapy for insomnia improves sleep and decreases pain in older adults with co-morbid insomnia and osteoarthritis. *J Clin Sleep Med* 2009; **5(4)**: 355–362.
16. Jungquist CR, O'Brien C, Matteson-Rusby S, *et al.* The efficacy of cognitive-behavioral therapy for insomnia in patients with chronic pain. *Sleep Med* 2010; **11(3)**: 302–309.
17. Espie CA, Fleming L, Cassidy J, *et al.* Randomized controlled clinical effectiveness trial of cognitive behavior therapy compared with treatment as usual for persistent insomnia in patients with cancer. *J Clin Oncol* 2008; **26(28)**: 4651–4658.
18. Department of Health. *Improving Access to Psychological Therapies (IAPT): commissioning toolkit*. London: Department of Health, 2008.
19. McKinstry B, Wilson P, Espie C. Non-pharmacological management of chronic insomnia in primary care. *Br J Gen Pract* 2008; **58(547)**: 79–80.
20. Neylan TC. Time to disseminate cognitive behavioral treatment of insomnia: comment on 'Efficacy of brief behavioral treatment for chronic insomnia in older adults'. *Arch Intern Med* 2011; **171(10)**: 895–896.
21. National Institute for Health and Clinical Excellence. *Computerised cognitive behaviour therapy for depression and anxiety: guidance*. National Institute for Health and Clinical Excellence Technology Appraisal Guidance 97. London: NICE, 2006.
22. Department of Health. *Improving Access to Psychological Therapies. IAPT programme 2012*. London: Department of Health, 2012.
23. Strom L, Pettersson R, Andersson G. Internet-based treatment for insomnia: a controlled evaluation. *J Consult Clin Psychol* 2004; **72(1)**: 113–120.
24. Vincent N, Lewycky S. Logging on for better sleep: RCT of the effectiveness of online treatment for insomnia. *Sleep* 2009; **32(6)**: 807–815.
25. Ritterband LM, Thorndike FP, Gonder-Frederick LA, *et al.* Efficacy of an Internet-based behavioral intervention for adults with insomnia. *Arch Gen Psychiatry* 2009; **66(7)**: 692–698.
26. Espie CA, Kyle SD, Williams C, *et al.* A randomized, placebo-controlled trial of online cognitive behavioral therapy for chronic insomnia disorder delivered via an automated media-rich web application. *Sleep* 2012; **35(6)**: 769–781.
27. Thorndike FP, Saylor DK, Bailey ET, *et al.* Development and perceived utility and impact of an internet intervention for insomnia. *E J Appl Psychol* 2008; **4(2)**: 32–42.
28. Kaltenthaler E, Sutcliffe P, Parry G, *et al.* The acceptability to patients of computerized cognitive behaviour therapy for depression: a systematic review. *Psychol Med* 2008; **38(11)**: 1521–1530.
29. Williams C, Whitfield G. Written and computer-based self-help treatments for depression. *Br Med Bull* 2001; **57**: 133–144.
30. Stallard P, Richardson T, Velleman S. Clinicians' attitudes towards the use of computerized cognitive behaviour therapy (cCBT) with children and adolescents. *Behav Cogn Psychother* 2010; **38(5)**: 545–560.
31. Bouchard S, Bastien C, Morin CM. Self-efficacy and adherence to cognitive-behavioral treatment of insomnia. *Behav Sleep Med* 2003; **1(4)**: 187–199.
32. Hebert EA, Vincent N, Lewycky S, Walsh K. Attrition and adherence in the online treatment of chronic insomnia. *Behav Sleep Med* 2010; **8(3)**: 141–150.
33. Webb TL, Joseph J, Yardley L, Michie S. Using the internet to promote health behavior change: a systematic review and meta-analysis of the impact of theoretical basis, use of behavior change techniques, and mode of delivery on efficacy. *J Med Internet Res* 2010; **12(1)**: e4.
34. Ajzen I. From intentions to actions: a theory of planned behavior. In: Kuhl J, Beckmann J, eds. *Action control: from cognition to behavior*. Berlin, NY: Springer-Verlag, 1985; 11–39.
35. Barbour RS, Kitzinger J. *Developing focus group research: politics, theory and practice*. London: Sage, 1999.
36. Boyatzis RE. *Transforming qualitative information: thematic analysis and code development*. Thousand Oaks: Sage Publications, 1998.
37. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psych* 2006; **3**: 77–101.
38. Coyle D, Doherty G, Matthews M, Sharry J. Computers in talk-based mental health interventions. *Interact Comput* 2007; **19(4)**: 545–562.
39. Mays N, Pope C. Qualitative research in health care. Assessing quality in qualitative research. *BMJ* 2000; **320(7226)**: 50–52.
40. Eysenbach G, Kohler C. How do consumers search for and appraise health information on the world wide web? Qualitative study using focus groups, usability tests, and in-depth interviews. *BMJ* 2002; **324(7337)**: 573–577.
41. Freeman KS, Spyridakis JH. An examination of factors that affect the credibility of online health information. *Tech Commun* 2004; **51**: 239–263.
42. Metzger MJ. Making sense of credibility on the Web: models for evaluating online information and recommendations for future research. *J Am Soc Inform Sci Tech* 2007; **58(13)**: 2078–2091.
43. Ye Y. Correlates of consumer trust in online health information: findings from the health information national trends survey. *J Health Commun* 2011; **16(1)**: 34–49.
44. Ye Y. A path analysis on correlates of consumer trust in online health information: evidence from the health information national trends survey. *J Health Commun* 2010; **15(Suppl 3)**: 200–215.
45. Siriwardena AN, Apekey T, Tilling M, *et al.* General practitioners' preferences for managing insomnia and opportunities for reducing hypnotic prescribing. *J Eval Clin Pract* 2010; **16(4)**: 731–737.
46. Dyas JV, Apekey TA, Tilling M, *et al.* Patients' and clinicians' experiences of consultations in primary care for sleep problems and insomnia: a focus group study. *Br J Gen Pract* 2010; **60(574)**: 180–200.
47. Thom DH. Physician behaviors that predict patient trust. *J Fam Pract* 2001; **50(4)**: 323–328.
48. Thom DH, Kravitz RL, Bell RA, *et al.* Patient trust in the physician: relationship to patient requests. *Fam Pract* 2002; **19(5)**: 476–483.
49. Caplan SE. Preference for online social interaction: a theory of problematic Internet use and psychosocial wellbeing. *Commun Res* 2003; **30**: 625–648.
50. Newman MW, Lauterbach D, Munson SA, *et al.* 'It's not that I don't have problems, I'm just not putting them on Facebook': challenges and opportunities in using online social networks for health. CSCW Proceedings of the ACM 2011 Conference on Computer Supported Cooperative Work, Hangzhou, China, 19–23 March 2011; 341–350.
51. Economist.com. Social networks — primates on Facebook: even online, the neocortex is the limit. *The Economist* 26 February 2009. <http://www.economist.com/node/13176775> (accessed 15 Oct 2012).
52. Winzelberg A. The analysis of an electronic support group for individuals with eating disorders. *Comput Hum Behav* 2012; **13**: 393–407.
53. White M, Dorman SM. Receiving social support online: implications for health education. *Health Educ Res* 2001; **16(6)**: 693–707.
54. Wright K. Perceptions of on-line support providers: an examination of perceived homophily, source credibility, communication and social support within on-line support groups. *Commun Q* 2000; **48**: 44–59.
55. Bender JL, Radhakrishnan A, Diorio C, *et al.* Can pain be managed through the Internet? A systematic review of randomized controlled trials. *Pain* 2011; **152(8)**: 1740–1750.

## Appendix 1. Topic guide

- What are health professionals and patients experiences with cognitive behavioural therapy (CBT)/ computerised CBT (CCBT)/CCBT for insomnia (CCBT-I) and why it may, or may not have worked in the past
- What would encourage GPs (and other health professionals) to refer patients for CCBT-I and would patients be willing for that referral?
- What do GPs/other health professionals and patients think about communicating progress from the completed CCBT-I package to their GP or other nominated health professional?
- What would patients and health professionals like to see in the CCBT-I package and how would they like it presented?
- How long would patients be willing to spend on the CCBT-I package per day?
- What do patients think about communicating including through an online social network with others suffering from sleep problems as part of the CCBT-I package?
- What ethical processes and safeguards need to be considered and in place?