

Impact case study (REF3b)

Institution: University of Glasgow
Unit of Assessment: Unit 4; Psychology, Psychiatry and Neuroscience
Title of case study: Sleepio, an online course of cognitive behavioural therapy for insomnia adopted by the UK NHS and sold by Boots UK Plc.
<p>1. Summary of the impact</p> <p>Around 28% of people worldwide will experience a sleep disorder at some point in their lives. Cognitive behavioural therapy (CBT) is an optimal treatment of choice for sleep disorders, but access to treatment is limited by the low number of expert CBT practitioners, resulting in long waiting times for CBT. University of Glasgow Sleep Centre research led to the development of an online CBT course ('Sleepio'), which has been sold online since 2010, and since September 2012 has been sold online by The Boots Company Plc. (Boots). Sleepio has been included in the NHS Health Apps Library and selected for integration with two of the best-selling fitness monitors. University of Glasgow expertise also underpinned 'Sleep Matters', a year-long campaign by the UK Mental Health Foundation (MHF) which generated 300 media articles with a combined circulation of 145 million, raising awareness of and widening access to treatment for sleep disorders.</p>
<p>2. Underpinning research</p> <p>Chronic insomnia is a highly prevalent clinical sleep disorder characterised by difficulty getting to sleep and remaining asleep. In the UK, 70% of insomnia cases persist for three years or more after diagnosis. Sufferers report that the resulting exhaustion has a destructive impact on their daily lives, affecting mental health, work and home relationships, along with the ability to concentrate.</p> <p>The University of Glasgow Sleep Centre has conducted frontline research into treating sleep disorders in general practice using cognitive behaviour therapy (CBT), an evidence-based form of psychotherapy that encourages patients to change how they think about their condition and provide them with skills to manage these thoughts and behaviours.</p> <p>Professor Colin Espie (Professor of Clinical Psychology, 1995–2012) and his team at the University of Glasgow Sleep Centre have conducted research to evaluate new methods of delivering evidence-based CBT to patients with chronic insomnia. Between 1995 and 1997, the clinical benefit of CBT in treating patients with chronic insomnia was evaluated in a small trial.¹ The University of Glasgow team trained Health Visitors (primary community care nurses) to become specialist CBT therapists by educating them in sleep scheduling (relaxation therapy) and CBT (recognising and modifying distorted thoughts and managing anxiety). The Health Visitors were provided with the skills to deliver CBT in a local GP surgery or health centre setting, where insomniacs are usually seen. An evidence-based 'CBT for insomnia' manual was developed by the University of Glasgow researchers providing a framework for the therapy. In the trial, 139 patients with chronic insomnia (roughly half of whom had previously been taking sleep medication) were randomly assigned to receive either a six-week course of CBT or placebo (self-monitoring), without sleep medication (patients reliant on medication received support in withdrawal as part of the programme). The study revealed that the CBT group experienced a substantial reduction in the time taken to fall asleep with reduced periods of wakefulness when compared to the placebo group. A follow-up of patients one year after treatment revealed that these positive benefits were maintained in the group who received CBT and that 84% of patients remained free of medication.¹ Between 2001 and 2003, the researchers tested the benefit of delivering CBT for patients with chronic insomnia in nurse-led group sessions against standard GP care (offering appointments to prescribe, and to maintain/discontinue prescriptions). Results published in 2007 revealed that patients who received CBT reported significantly better sleep outcomes, mental health and energy levels than those receiving standard GP care.²</p> <p>Building directly on these two studies, Espie collaborated with Peter Hames (an independent entrepreneur) in 2010 to develop the evidence-based manuals used in the above trials into an internet-based insomnia CBT course named 'Sleepio'. The online course comprised a media rich,</p>

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user-friendly environment in which CBT for insomnia was delivered by an animated virtual therapist. The University of Glasgow researchers subsequently designed and led a randomised placebo-controlled trial of the online course in which 164 patients were assigned to receive one of the following options: the online course (CBT), a sham placebo therapy called imagery relief therapy (IRT, an identical online environment design with a virtual therapist but with no active CBT content) or treatment as usual (TAU, the equivalent to GP standard of care). This was the first adequately placebo-controlled trial of CBT for insomnia in an online format. The results, published in 2012, revealed significantly greater improvement in the primary endpoint of sleep efficiency (total time asleep expressed as a percentage of the total time spent in bed) in the CBT group when compared to the IRT or TAU groups.³ An eight-week follow-up survey indicated that benefits in the CBT group were maintained, thus confirming the lasting benefits of the online delivery method for CBT to patients with chronic insomnia.

Key external collaborators: Professor June Brown (Senior lecturer in Clinical Psychology, King's College London; co-investigator on Espie *et al.*, 2012)³

3. References to the research

1. Espie, CA, Inglis, SJ, Tessier, S, and Harvey, L. [The clinical effectiveness of cognitive behaviour therapy for chronic insomnia: Implementation and evaluation of a Sleep Clinic in general medical practice](#). *Behav. Res. Ther.* 2001; 39, 45-60. doi: 10.1016/S0005-7967(99)00157-6.
2. Espie, CA, MacMahon, KMA, Kelly, HL, Broomfield, NM, Douglas, NJ, Engleman, HE, McKinstry, B, Morin, CM, Walker, A & Wilson, P. [Randomised clinical effectiveness trial of nurse-administered small group CBT for persistent insomnia in general practice](#). *Sleep* 2007; 30, 574-584. [no doi available]
3. Espie CA, Kyle SD, Williams C, Ong JC, Douglas NJ, Hames P, Brown JS. [A randomized, placebo-controlled trial of online cognitive behavioural therapy for chronic insomnia disorder delivered via an automated media-rich web application](#). *Sleep*, 2012; 35(6):769-81. doi: 10.5665/sleep.1872.

4. Details of the impact***Addressing the lack of CBT for chronic insomnia***

Long-term medication is not recommended for chronic insomnia due to the risk of dependence and eventual tolerance, thus the optimal treatment of choice for sleep disorder patients is CBT. This practice is recommended within clinical guidelines such those of the National Institute for Health and Care Excellence (NICE) and Scottish Intercollegiate Guidelines Network (SIGN), but access to treatment has typically been limited by the low numbers of expert CBT practitioners, resulting in long waiting times.

The University of Glasgow Sleep Centre has led the field of CBT for chronic insomnia and in improving access to such therapies through multimedia formats. This work has led to the following impacts:

- the creation of a five-week online CBT for insomnia programme (later named 'Sleepio', and made available through its website since 2010) providing substantial improvements to patient outcomes and quality of life
- the adoption and distribution of the Sleepio programme by health and well-being providers, including Boots and the NHS (as part of the best-selling 'Overcoming' series, the 'books on prescription' scheme and in the Health Choices Apps library
- raised public awareness of insomnia through public surveys and media campaigns such as the year-long 'Sleep Matters' campaign by the Mental Health Foundation (MHF) in 2011

These impacts are discussed in more detail below.

Establishment of Sleepio

Sleepio is an online CBT course designed to treat chronic insomnia and sleep disorders. The course was conceptualised by Peter Hames (an independent entrepreneur) who was aware of the inadequacies of CBT provision in primary healthcare and approached Espie after benefiting himself from the techniques developed by Espie and the Glasgow Sleep Centre.^a Espie designed clinical controlled trials and refined the programme, which was branded and launched in 2010 as a for-profit course designed to lead the user through a series of personalised CBT sessions and provide them with access to an online support community. Users fill out a questionnaire detailing their particular sleep problems and patterns, receive weekly automated sessions with the online 'Prof' that are tailored to the information they provide throughout the course; their progress is tracked and suggestions and other resources (e.g. relaxation audios) are provided to help them gain full benefit from the treatment. Glasgow's 2012 study³ revealed that more than 70% of insomniacs using Sleepio have found lasting benefits from the course, experiencing an average 50% reduction in time taken to fall asleep and a 60% reduction in sleeplessness during the night. Sleepio users also rated their quality of sleep as having more than doubled and reported an average increase in energy and daytime wellbeing levels of 58%. Examples of the changes in quality of life experienced by users are as follows:^b

'I am a practicing GP, and have personally experienced sleep difficulties for many years. GP training is woefully inadequate when it comes to managing insomnia, and I was poorly equipped to help myself. As a result of discovering Sleepio and completing the course, I'm not only a much better sleeper but have a much greater ability to assess my patients' sleep difficulties. I am much better placed to give constructive advice'. – Sleepio User Review

'Before Sleepio I felt so down and just couldn't see an end to my sleep problems... I'm now actually living my life again. I have even managed to go back to work full-time'. – Sleepio User Review

Adoption by health and well-being service providers

In 2011, researchers from the University of Glasgow Sleep Centre collaborated with the MHF to run a year-long campaign ('Sleep Matters') to raise awareness of and help to address sleep disorders across the UK. The MHF produced a 16-page pocket guide entitled 'Sleep Well'.^d The MHF guide was produced with the assistance of Professor Espie, and the information and advice it provides states clearly that it is based on the research carried out at the University of Glasgow Sleep Centre; the guide also refers users to Espie's 2006 publication, *Overcoming Insomnia and Sleep Problems*.^d 'Sleep Well' explains how mental health is adversely affected by poor sleep, with a much higher chance of sufferers developing depression or anxiety, and emphasises how poor sleep is a significant factor in poor general health. The guide calls for increased attention to sleep problems by the Royal College of GPs, advocating training for all GPs in recognising and treating sleep problems, as well as the development of NICE guidelines on prescribing CBT for insomnia. It also incorporates a number of elements of the commercial Sleepio course, such as offering a template of its Sleep Diary, and tips for improving sleep quality. The MHF materials also include, among other support recommendations, both the Sleepio course and Espie's 'Overcoming Sleep and Sleep Problems'.

In addition, the 'Sleep Matters' campaign incorporated data from the Great British Sleep Survey^{e,f}, and online, public-access study launched in 2010 by the University of Glasgow Sleep Centre and Sleepio, and adopted/promoted by Boots Plc. in 2013. One of the MHF campaign objectives was to raise public awareness of the problems and available solutions for chronic sleep disorders, and the Foundation's 2011 Annual Review reported that the campaign had generated 300 media articles with a combined coverage of 145 million people.^c

Sleepio has been sold from its website (www.sleepio.com) since 2010. Since September 2012 it has also been available from Boots.com.ⁱ In late March 2013, the NHS launched the first version of its NHS Choices Health Apps Library offering patients and practitioners access to health

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management apps that have been reviewed and approved by a clinical assurance board. Sleepio was among the first group of apps offered on this site, and averages a five-star (highest) rating among users.⁹ In April 2013, Sleepio was selected as one of only 10 apps for integration with the UP™ by Jawbone.^l The UP™ is one of three top-selling wrist-worn fitness monitors (similar to the Fitbit™ and Nike FuelBand™) in what is expected to be a £400 million market by 2016 (global business analysts IHS estimate that the number of wearable fitness sensors sold will rise from 43.8 million units in 2013 to 56.2 million in 2017). These are particularly popular in the US and Canada, which extends the reach of Sleepio's CBT therapy beyond the UK to a worldwide market. The following month (May 2013) Sleepio was also integrated into the BodyMedia FIT™ armband health monitor.^k

Additional impact

Overcoming Insomnia and Sleep Problems : A Self-Help Guide Using Cognitive Behavioral Techniques, written by Espie based on the Sleep Centre work and published in 2006 (ISBN: 978-1-84529-070-2), continues to be a bestseller on Amazon.co.uk. As of July 2013 it ranked #1 bestseller in the category 'Specific Disorders and Categories', #3 in 'Sleep Disorders' and #4,021 of all books sold on Amazon (approx. 1.7 million total). In the book's preface, Espie acknowledges the contribution of the University of Glasgow Sleep Centre research team and describes the book as 'pretty much a complete CBT treatment guide for insomnia; the way I would present it to you if you came to my clinic in Glasgow'. The average user rating is 4.4 out of 5 stars, with users' reviews testifying that reading the book helped them to overcome their insomnia. An introductory version of the book has also been published as part of the 'Overcoming' series' recommended by the UK Department of Health and offered as part of the NHS 'Books on Prescription' programme.^h

5. Sources to corroborate the impact

- a. ['The Sleepio story so far'](#), by Peter Hames, February 2012 (on Sleepio benefits which led to his participation).
- b. [Reviews by Sleepio users.](#)
- c. [Annual Review 2010-11](#), (citing contribution of Glasgow Sleep Centre to public mental health and wellbeing campaign, pgs 11-12).
- d. ['Sleep Well: Pocket guide to better sleep'](#) (citing University of Glasgow Sleep Centre research).
- e. [How the UK is sleeping – results of the Great British Sleep Survey](#), September 2012.
- f. [The Great British Sleep Survey](#), the Respondents at a Glance.
- g. [Inclusion in the NHS 'Choices' Apps Library.](#)
- h. [Inclusion in the NHS 'Overcoming' Series and in the Books on Prescription programme.](#)
- i. [Boots plc website offering Sleepio products.](#)
- j. [Press release re: integration with Jawbone UP.](#)
- k. [Press release re: integration with BodyMedia FIT.](#)