

Internet Supported Psychological Interventions (ISPIs) and mobile phone applications: A literature review and proposed model

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Pieter Rossouw and Francesca Reddington, The University of Queensland, Brisbane, Australia

Introduction

In recent years a significant number of internet based interventions aiming to enhance mental wellness have been introduced ([Barak, Hen, Boniel-Nissim, & Shapira, 2008](#); [Christensen & Petrie, 2013](#)). These interventions are referred to in the literature as: internet-based cognitive behavioural therapy (iCBT), interactive computer based interventions (ICBI), ehealth, telehealth, online, cyber, digital, computer-based, computer-oriented, computer-aided, computer-assisted, computer-mediated, internet-delivered, internet-based, internet supported or low intensity. Their use is rapidly becoming the new frontier in psychotherapeutic exploration for the twenty first century. The Australian Psychological Society (APS) comments that with the incorporation of Internet Supported Psychological Interventions (ISPIs) into professional practice:

there exists enormous potential for increasing the public's access to evidence based health and well-being services, as well as offering psychologists increased choice and flexibility for delivering [these] services ([Australian Psychological Society, 2012, p. 4](#)).

Support for the incorporation of human-supported computer and web-based therapeutic interventions into the therapeutic arena is growing ([Cuijpers et al., 2009](#); [Hilvert-Bruce, Rossouw, Wong, Sunderland, & Andrews, 2012](#); [Spek et al., 2007](#)) and it is anticipated that these interventions will soon become a staple in the repertoire of the modern therapist.

The Australian Psychological Society (APS) recommends that ISPIs should be defined by the purpose of the intervention rather than the mode or type of technology used in the intervention ([Australian Psychological Society, 2012](#)). This conceptual shift focuses on the terminology used by [Barak, Klein, and Proudfoot \(2009\)](#). [Barak et al. \(2009\)](#) defines four types of internet supported interventions: *web-based interventions* (web-based education interventions, self-guided web-based therapeutic interventions, human supported web-based therapeutic interventions), *online counselling*, *internet operated therapeutic software* (robotic simulation, games and virtual environments) and *other online activities* (blogs, podcasts, support groups, assessments). The model of care proposed in this

article utilizes human supported web-based interventions according to the classification system of [Barak et al. \(2009\)](#). The purpose is to integrate the use of ISPIs into existing therapist-client relationships.

Whilst it is intuitively logical and no doubt cost effective to utilise computer and mobile phone-based technologies to reduce the burden of disease and enhance individual outcomes, careful research and planning with regard to how this can best be achieved is fundamental. In this literature review, a search was conducted of meta-analyses, review and research articles on internet supported interventions for psychological and physical complaints in order to examine the implications of usability, attrition, human support and theoretical approach. Furthermore, evaluating the most suitable model of care for the incorporation of ISPIs into practice was another important consideration. Many encouraging outcomes for computer and internet supported interventions into psychological and physical problems have been highlighted in research articles and reviews that examined interventions for a wide range of conditions, including smoking, obesity, sexual health promotion, insomnia, headaches, eating disorder, encopresis, stress, anxiety and depression ([Bailey et al., 2010](#); [Barak et al., 2008](#); [Bergström et al., 2009](#); [Carlbring et al., 2005](#); [Civljak, Sheikh, Stead, & Car, 2010](#); [Cuijpers et al., 2009](#); [Dear et al., 2011](#); [Griffiths & Christensen, 2006](#); [Hilvert-Bruce et al., 2012](#); [Kenardy, McCafferty, & Rosa, 2003](#); [Klein & Richards, 2001](#); [Klein, Richards, & Austin, 2006](#); [March, Spence, & Donovan, 2009](#); [Richards & Alvarenga, 2002](#); [Richards, Klein, & Austin, 2006](#); [Richards, Klein, & Carlbring, 2003](#); [Rotondi et al., 2010](#); [Spek et al., 2007](#); [Wieland et al., 2012](#); [Wims, Titov, Andrews, & Choi, 2010](#)). The increasing research interest in the area of ISPIs mirrors the demand from therapists, clients and policy makers for effective, flexible, accessible, low cost and mass-oriented psychotherapeutic interventions in the health care sector ([Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010](#); [Christensen, 2010](#); [L'Abate, 2001](#)). However, even though the use of ISPIs by consumers and health systems is rapidly increasing only 35.5% of these programs have been evaluated by at least one randomized control trial (RCT) ([Christensen & Petrie, 2013](#)). Therefore, it is important to examine the evidence-based research to provide a better understanding of the therapeutic and design considerations in developing ISPIs, which is an integral part of the proposed new model of care.

Literature review of ISPIs

The review identified studies that examined the effects of ISPIs for people with Panic Disorder (PD) ([Bergström et al., 2009](#); [Carlbring et al., 2005](#); [Klein & Richards, 2001](#); [Klein et al., 2006](#); [Richards & Alvarenga, 2002](#); [Richards et al., 2006](#); [Wims et al., 2010](#)). All studies found significant reductions in symptomatology or severity of participants' Panic Disorder. These studies incorporated between three to 10 cognitive behavioural therapy (CBT) ISPI modules as an intervention strategy with control group comparisons in all but one study ([Richards & Alvarenga, 2002](#)) and follow up assessments in all but one study examining a brief intervention ([Klein & Richards, 2001](#)). These studies therefore concluded that ISPIs provide effective interventions for Panic Disorder.

Four of these studies examined the use of ISPIs for people with anxiety sensitivity, anxiety or depressive disorders ([Dear et al., 2011](#); [Hilvert-Bruce et al., 2012](#); [Kenardy et al., 2003](#); [March et al., 2009](#)). These studies incorporated between six to 10 cognitive behavioural therapy (CBT) ISPI modules as an intervention strategy and found reductions in symptoms and levels of distress. One study attributed these treatment effects to expectancy, which is a common factor found across therapy models ([Kenardy et al., 2003](#)). Another study examined the effects of online psycho-education for persons living with schizophrenia and their family members ([Rotondi et al., 2010](#)) and found significant reductions in positive symptoms for clients and significant increases in knowledge about the prognosis of schizophrenia for the family members.

The clinical significance of outcomes associated with ISPIs was reported in seven studies. An average of 65% (range 30-95%) of participants at post-treatment and 76.8% (range 59-92%) of participants at follow up (assessed between three months to one year post-treatment) no longer met the criteria for their original diagnosis ([Bergström et al., 2009](#); [Carlbring et al., 2005](#); [Dear et al., 2011](#); [Klein & Richards, 2001](#); [March et al., 2009](#); [Richards et al., 2006](#); [Wims et al., 2010](#)). Therefore, there is substantial evidence for the merit of ISPI use with positive treatment effects and reductions in symptomatology, severity and levels of distress.

It should be noted that the general applicability of research findings is limited by the criteria for acceptance of participants in many research studies, in which potential participants with higher levels of symptom severity and more complex problems are excluded ([Carlbring et al., 2005](#); [Klein & Richards, 2001](#); [Klein et al., 2006](#); [Richards & Alvarenga, 2002](#); [Richards et al., 2006](#); [Wims et al., 2010](#)). The narrowing of the criteria for participant entry into research studies, with the possible exclusion of participants with complex problems and high levels of severity, can impact the reported research outcomes ([Andersson et al., 2008](#)).

The potential of ISPIs to reduce emotional distress rests upon the capacity of the program to be accessible and appealing to users ([Currie, McGrath, & Day, 2010](#)). Therefore, clients' experience of using ISPIs can influence their level of engagement and attrition. The common themes that emerge in the literature with regard to the usability of an ISPI include design features, visual appeal, consistency, choice, provision of information about the developer, interactivity, personalisation and support ([Hurling, Fairley, & Dias, 2006](#); [Michie et al., 2012](#); [Spence et al., 2008](#)).

Specific usability features have additionally been highlighted. [Michie et al. \(2012\)](#) designed an internet supported intervention with smokers, and identified design considerations such as making greater use of bold font to emphasise key points, keeping the fonts and basic site structure uniform, removing unhelpful jargon and terminology, maintaining consistency to encourage regular use, and managing users' expectations about the site. [Rotondi et al. \(2007\)](#) designed websites for persons with cognitive deficits, and restricted the vocabulary to an eight grade level, used simple radio buttons with a drop down menu that did not obscure other choices and kept the frame of the site constant so that the tool bar was always at the top. [Andersson et al. \(2008\)](#) note that

developers should keep ISPIs simple and user friendly by relying on plain text, simple pictures and downloadable pdf files, and avoiding plug-in programs, to remain in tune with the technological abilities of the general public. Additionally, attempts to introduce online supplements such as forums, email, supplementary websites and audio features, into ISPI methods have not been very effective, possibly because of the potential to distract clients' attention and to reduce their perceived level of privacy and anonymity ([Barak et al., 2008](#)). The importance of visual appeal has emerged as a design feature that impacts the usability of ISPIs for clients. Visual appeal can be enhanced by increasing the number of web pages with pictures or images (including photos, graphics, video, cartoons and use of colour) to enhance the meaning of the text ([Currie et al., 2010](#); [Hilvert-Bruce et al., 2012](#); [Michie et al., 2012](#); [Rotondi et al., 2007](#); [Spence et al., 2008](#)). Good design, consistency and visual appeal have all been demonstrated to enhance usability as well as building in choice, interactivity and personalisation.

The provision of the fundamental human need for control whilst engaging with ISPIs was recognised as an important design principle during usability testing ([Michie et al., 2012](#); [Yardley, Morrison, Andreou, Joseph, & Little, 2010](#)). The usability of ISPIs enhances clients' experience of control. Interactivity and personalisation, including referring to clients by name, personalisation of the "source" of the site by adding biographies or histories, and providing feedback and encouragement about session tasks, were determined to be important features that enhance the usability of ISPIs ([Michie et al., 2012](#); [Spence et al., 2008](#)).

Interactive web based therapy was found to have a statistically higher effect size than static sites ([Barak et al., 2008](#)). More specifically, [Civljak et al. \(2010\)](#), in an internet-based review of programs for smoking cessation, found evidence that internet based programs can assist people to stop smoking for six months or more, particularly when these interventions are tailored to individual users and are interactive. Also, [Hurling et al. \(2006\)](#), in an examination of interactivity in a web-based exercise intervention system, demonstrated that a more interactive intervention, which they called "the exercise motivation and action support system" contributed to better retention, satisfaction and motivation as well as larger increases in exercise engagement compared to a less interactive version of the same system. Therefore, promotion of interactivity, personalisation and control in the use of ISPIs enhances usability and outcomes.

The issue of attrition also needs to be examined. High levels of attrition have been reported for ISPIs and therefore the causes of attrition need to be a consideration in the development stage ([Hilvert-Bruce et al., 2012](#); [Richards et al., 2003](#)). The average attrition rate identified in this literature review was approximately 18% with a range of between 3% and 40% ([Bergström et al., 2009](#); [Carlbring et al., 2005](#); [Dear et al., 2011](#); [Hilvert-Bruce et al., 2012](#); [Kenardy et al., 2003](#); [Klein & Richards, 2001](#); [Klein et al., 2006](#); [March et al., 2009](#); [Richards & Alvarenga, 2002](#); [Richards et al., 2006](#); [Rotondi et al., 2010](#); [Wims et al., 2010](#)). Additionally, in two meta-analyses comprising 23 studies on

ISPIs with anxiety disorders ([Cuijpers et al., 2009](#)) and 22 studies on ISPIs with depression and anxiety disorders ([Andrews et al., 2010](#)), the range for attrition was 2-29% and 0-52% (median 20%) respectively.

Meeting the needs of clients with greater levels of severity of mental disorder and complex problems, particularly in relation to outcomes and attrition, is another important consideration. ISPIs are reported to be less effective for people with a diagnosis of depression, whereas people with anxiety disorders respond to ISPI treatment more effectively ([Barak et al., 2008](#); [Griffiths & Christensen, 2006](#)). Furthermore, [Kenardy et al. \(2003\)](#), in the application of a preventative, internet-delivered CBT intervention for individuals at risk of developing anxiety disorders, commented that although their program was considered “tolerable”, participants who dropped out had higher levels of anxiety sensitivity and depressive symptomatology. However, an internet based treatment for Panic Disorder with email support in a psychiatric setting, demonstrated significant reductions in the percentage of clients that met the criteria for Panic Disorder post treatment (94%) and at six month follow up (82%) ([Bergström et al., 2009](#)). This research study demonstrates that ISPIs can be efficacious with clients in a psychiatric setting who are likely to be experiencing severe symptomatology, when support is provided. This trial provided an alternative option to face to face psychotherapy or medication in the range of treatments for clients with high symptom severity ([De Giacomo & De Nigris, 2001](#)). These findings highlight the importance of a supportive approach to ISPI use, particularly for more vulnerable clients.

Rates of attrition in ISPIs can be reduced by the provision of human support by a therapist ([Hilvert-Bruce et al., 2012](#); [Richards et al., 2003](#)). Human supported web-based interventions guided by an online therapist fit somewhere between face to face therapy and stand alone web-based interventions in terms of therapist contact ([Andersson et al., 2008](#)) and demonstrate effectiveness in many studies using web-based CBT interventions ([Bergström et al., 2009](#); [Carlbring et al., 2005](#); [Klein et al., 2006](#); [March et al., 2009](#); [Richards et al., 2003](#); [Wims et al., 2010](#)). Consequently, there has been a noticeable shift for interventions on the web to incorporate human interaction (predominately text-based) with interventions that were previously self-administered ([Carlbring & Andersson, 2006](#)). In one estimation, the saving to clinician time with ISPI use is about 50-80%, however, interactivity and individualised support is considered preferential to an entirely automated ISPI system ([Andersson et al., 2008](#)). For example, one ISPI called BRAVE allocates a “trainer” with a photo, short biography and online exercise with guided questions to get to know each other and weekly automatic emails before and after sessions to enhance therapeutic alliance ([Spence et al., 2008](#)). Moreover, no significant difference in attrition was found between web-based interventions and face to face therapy when therapist assistance was provided ([Carlbring et al., 2005](#); [Richards et al., 2003](#)). This finding clearly demonstrates the importance of reducing attrition in developing human-supported web-based interventions.

A meta-analysis of web-based CBT interventions for depression and anxiety clearly outlines the importance of therapist support for clients undertaking internet based interventions ([Spek et al., 2007](#)). [Spek et al. \(2007\)](#) report that interventions with therapist support have a large mean effect size and that interventions without therapist support have a small mean effect size. Other meta-analyses report that ISPIs and face to face therapy do not differ significantly in effect ([Andrews et al., 2010](#); [Barak et al., 2008](#); [Cuijpers et al., 2009](#)). However, further examination of the comparable outcomes of ISPIs and face to face therapy reveals that the variable of “support” is often intrinsically intertwined in many individual programs and subsequent meta-analyses. For example, [Barak et al. \(2008\)](#), in a very extensive meta-analysis of web-based interventions for a variety of psychological and physical problems, reported an average medium effect size similar to the effect size of face to face therapy. However, about two thirds of the 64 articles reviewed contained elements of therapist support, either in forums, telephone, chat, email or webcam ([Barak et al., 2008](#)). [Andrews et al. \(2010\)](#) reviewed 22 articles of which 12 contained a component of therapist support, which is likely to have contributed to the overall positive impact of ISPIs. A direct comparison of internet-administered self-help and traditional face to face CBT revealed equal effectiveness, however, minimal therapist support via e-mail was provided in the internet self-help intervention ([Carlbring et al., 2005](#)). Moreover, [Cuijpers et al. \(2009\)](#) analysed 14 computer based psychotherapy systems, all but two with therapist contact, and found the effects of ISPIs for individuals with anxiety disorders to be directly proportional to therapist support and significantly smaller when less therapist time was spent with clients. Furthermore, [Richards et al. \(2003\)](#) in their review of an internet based treatment program for Panic Disorder found that participant attrition was lower if timely therapist assistance was provided.

Therapist support is obviously of critical importance in the outcome of ISPIs for clients. However, there are necessary cost-benefit considerations that require exploration of the balance between costs and outcomes, which are influenced by the type of human support provided (clinician versus administrator, phone/email versus face to face) and duration of human support (brief versus enhanced) required as an adjunct to an ISPIs ([Cuijpers et al., 2009](#)). Many aspects of human support provided in ISPIs appear to be manageable by a non-therapist, however, there are aspects that involve deeper knowledge of mental disorders and therapeutic techniques and processes that need to be provided by guiding therapists ([Andersson et al., 2008](#)). Therefore, the inherent advantages of reduced social barriers to self-disclosure and reduction of time constraints for IPSI users, must be effectively tempered with a system of client monitoring, particularly in the areas of clients' understanding and application of the information provided, negative self attributions around treatment failure, assessment and diagnostic accuracy, suicide risk and attrition ([Carlbring & Andersson, 2006](#)).

The need for human support whilst using ISPIs aligns with the basic neurobiological need for attachment. Attachment theory emphasises the importance of the interpersonal aspects of the therapeutic relationship that provides a sense of safety for the clients, who are often affected by insecure attachment patterns ([Cozolino, 2006](#); [Grawe, 2007](#)). In face

to face interactions, it is hypothesized that mirror neurons allow the therapist to resonate with the client's internal state and to validate the client's feelings ([Siegel, 2006](#)), which foster a positive attachment. Therefore, the need for attachment should be provided within a face to face therapeutic relationship where the therapist provides a safe base, with the adjunct of ISPIs ([Sommers-Flanagan & Sommers-Flanagan, 2009](#)). A non-interactive, stand-alone program design, without therapist support, may prompt some clients to disengage from the process through the activation of avoidance patterns that are often a feature of anxiety and depressive disorders ([Grawe, 2007](#)). Therefore, ISPIs cannot fully replace the benefits of the face to face therapeutic relationship that provides human support and attachment.

The neuropsychotherapeutic “bottom up” approach

The importance of a “bottom up” approach to ISPI development, which focuses on “the need for a down regulated amygdala response to facilitate synaptic communication” ([Rossouw, 2012, p. 3](#)) can be enhanced by involvement from a supportive therapist. Additionally, traditional face to face therapy that incorporates the use of ISPIs aims to facilitate the left and right hemispheres of the brain to work more synergistically with each other ([L'Abate, 2001](#)), as spontaneous talk is largely a right brain activity and writing a left brain activity. This provides the client with a more integrated and holistic therapeutic process of therapeutic engagement.

Currently, a predominately “top down”, cognitive behavioural therapy (CBT) approach is evident in the development of many ISPIs ([Barak et al., 2008](#); [Christensen & Petrie, 2013](#)). In general, CBT interventions for anxiety and depression have been shown to result in symptom improvements and neurobiological changes associated with improved activity of “top-down” processes in brain regions such as the orbitofrontal cortex (OFC), medial prefrontal cortex (mPFC), and the ventral and dorsal anterior cingulate cortex (ACC) and decreased activity in the amygdala-hippocampal subcortical regions ([Jokic-Begic, 2010](#)). This “top down” approach requires some activation of the higher circuitry (left prefrontal cortex) of the brain ([Rossouw, 2012](#)). However, clients, particularly those with persistent symptoms of anxiety and depression, need to be able to down-regulate key stress regions like the amygdala, which can perpetuate continued activations in the limbic system, in order to facilitate synaptic communication to higher cortical areas on a consistent basis ([Davidson, 2002](#); [Grawe, 2007](#); [Rossouw, 2012](#)). The “bottom-up” approach instead facilitates neural activity which down-regulates the overactivity of survival (limbic) structures such as the amygdala, hypothalamus and basal ganglia. This down-regulation enables neural activity that enhances communication towards the frontal (neo-cortical) areas (left and right prefrontal cortexes) ([Ellingson, Verges, Littlefield, Martin, & Slutske, 2013](#)). The neuropsychotherapeutic approach is not a new form of psychotherapy but rather a new perspective that emphasises the neuroscientific foundations of psychotherapy with implications for how psychotherapists can assist clients to change their brains and access their inherent neuroplastic potential ([Grawe, 2007](#)). Neuropsychotherapeutic approaches are often considered to be reductionist as the focus is thought to be solely on neurochemical and neurostructural activity. However, research outcomes of the study of epigenetics have clearly demonstrated the ongoing

interplay between the brain and the environment (nature and nurture) (Grawe 2007). Therefore, the rationale for the adoption of a more “bottom up”, neuropsychotherapeutic approach rather than a strictly CBT approach to ISPI development is that the neural patterning, which is observable to the therapist as a mental disorder or pathology, tends to operate from within the more primitive parts of the brain that are implicated but not targeted during CBT (Jokic-Begic, 2010).

Proposed model: incorporating ISPSs into face to face therapy

In the new model of care proposed in this article, face to face therapy will incorporate ISPIs as well as a mobile phone application designed to provide a readily accessible, interactive platform for individuals to respond to their mental health concerns with immediacy. Incorporating a mobile application and ISPIs into the therapeutic process aims to facilitate and strengthen neural connections that promote wellness on a consistent basis to maximise outcomes for the client (see **Figure 1. New model of care**). When connections associated with wellness are wired together on a regular basis, the speed and efficiency of these neural connections will increase, accompanied by the subsequent reduction in the speed and efficiency of those that do not promote wellness (Arden, 2010; Grawe, 2007). The neuropsychotherapeutic approach used in the development of the ISPIs and the mobile phone application is informed by a neuroscientific understanding of the brain, which elucidates the brain’s neuroplastic and neurogenic potential to rewire and restructure itself based on new experiences such as those provided within the therapeutic process in order to promote behavioural changes associated with wellness (Arden, 2010).

In Australia, paediatricians have successfully used a mobile phone application designed as a self-monitoring tool to assist with assessment and management of youth mental health (Reid et al., 2012). Therefore, the utilisation of readily accessible mobile phone technologies assists in maximising outcomes for individuals, particularly individuals with social, physical, financial and time constraints that impinge upon their ability to engage with mental health services for extended time periods.

In addition to face to face therapy and ISPIs, the construction of an interactive diary-style application on personal mobile phones with guided analysis and reflection on the individual’s life and concerns can provide the stimulus to encourage the facilitation and establishment of more positive neural activations in the brain (Grawe, 2007). Within the new model of care, the basic need for attachment is provided within the face to face therapeutic environment that accompanies the use of the mobile phone application and ISPIs. It has been noted that “simply writing down our account of a challenging experience can lower the physiological reactivity and increase our sense of well-being” (Siegel, 2010, p. 187). Thus, journaling facilitates increased neural connections to the left prefrontal cortex (LPFC) associated with approach patterns rather than withdrawal or avoidance patterns associated with amygdala activation (Davidson, 2002).

The mi-life© automated interactive text-based dialogue application provides a format for individuals to find solutions that uniquely fit their lives through a responsive and supportive engagement with the technology that may be discussed with or shown to the consulting therapist, if desired. The client is able to reflect on past entries, action plans and outcomes and to reassess previous plans if they are no longer necessary or appropriate. The provision of individually tailored solutions via a text-based dialogue system has yielded positive outcomes already in an interactive exercise intervention system designed to reduce barriers to exercise ([Hurling et al., 2006](#)). Furthermore, the incorporation of an inbuilt facility that looks at personal statistics, such as time spent logged on to the application and issues raised, will assist individuals to reflect upon thematic mental health concerns and provide a clear picture of how to proceed.

The demand for improved outcomes for clients at a reduced cost has led to the proposition of this new model of care that incorporates ISPIs and the mobile phone application. Additionally, the feedback process to the therapist from the ISPI has already been used in the BRAVE program conducted with children, in which an online therapist was able to access responses to homework and session activities and create personalised responses using email aimed at reinforcing effort and success and clarifying misunderstandings of program content to clients ([March et al., 2009](#)). The new model of care utilises ISPIs in a different way to ISPIs that stand-alone or human supported ISPIs. In the proposed model, the client knows the guiding therapist and will be able to develop a supportive therapeutic relationship. The benefits of the therapeutic relationship are well documented ([Sommers-Flanagan & Sommers-Flanagan, 2009](#)). Therefore, it is important to acknowledge the value of human support embedded within the therapeutic alliance, which promotes engagement with ISPIs and reduces attrition ([Carlbring et al., 2005](#); [Richards et al., 2003](#)) as well as the potential to utilise information from the ISPI that is reported to the consulting therapist by the client in face to face sessions.

The aim of the mi-brain© ISPI is to provide features associated with enhanced usability such as: simple text; visual appeal; not too many words on one page; a set frame for each page with a menu with icons at the top of the page; short duration of modules and encouragement of breaks; personalisation; interactivity by offering access to a chart of the clients' K-10 and DASS-21 scores throughout their engagement with the mi-brain© ISPI; animations to enhance understanding of the topic (e.g. "anxiety and my brain") and provide visual appeal; and an administrator who acts as the mi-brain guide to address any technical concerns with the ISPIs. Additionally, the mi-brain© ISPI provides information on the brain in relation to topics (e.g. anxiety) and then invites clients to write notes about their lived experience with the problem. This is fed back to the consulting therapist after online informed consent is received from the client, which includes the facility to withdraw consent at any time ([March et al., 2009](#)). Access to the mi-brain© ISPI is available to clients by way of therapist subscription. Furthermore, as part of the proposed new model of care, there will need to be training provided to enhance therapist confidence in the incorporation of ISPIs into regular practice, which can also be made available online for remote therapists ([Bennett-Levy, Hawkins, Perry, Cromarty, & Mills, 2012](#)).

The mi-brain© ISPI incorporates a range of modules with different foci: for example, “understanding my anxiety”, “anxiety and my brain”, brain structures, the brain and substances, exercise, sleep, thinking strategies, nutrition, relaxation and self-esteem among others. As it is common practice for clinicians to give “homework” to clients at some stage during therapy, these modules can be used as a standardised form of client “homework”. These “homework assignments” have many advantages when used as an adjunct to the therapeutic process ([L’Abate, 2001](#)), including:

1. Giving the respondent [clients] something concrete to do about their problem above and beyond the 50 minute face to face talk session.
2. Providing impetus for carrying face to face, talk based therapy session themes further and deeper.
3. Providing structure and focus when problem(s) need to be broken down into more manageable parts.
4. Increasing the sense of direction (and generalisation) in treatment from the professional’s office to the home.
5. Increasing respondents’ sense of responsibility for their own progress in treatment.
6. Increasing choices available to professionals as well as respondents.
7. Increasing awareness and critical evaluation of set beliefs, cognitions, and behavioural patterns with a greater sense of choice about them. ([L’Abate, 2001, p. 13](#)).

Also, the clinician and the client can negotiate which ISPI modules to undertake, thereby establishing a stronger alliance, fostering a sense of control for the client and emphasising client-directed practice. Which modules to undertake and the pace and time of day to engage in the modules is within the client’s control.

Conclusion

This literature review indicates that ISPIs can successfully deliver positive treatment effects and reductions in symptomatology for clients with mental health needs. However, attrition and usability have emerged as important considerations in ISPI development. Furthermore, the support of an online therapist during ISPI engagement was revealed to be an important determinant of enhanced treatment outcomes. It is hypothesised however that interaction with an online therapist cannot adequately replace the well-documented benefits of the face to face therapeutic relationship and ISPIs could be used as an adjunct to the therapeutic process. Furthermore, this literature review revealed an overwhelming predominance of CBT based ISPIs. Therefore, research into the validity of other approaches to ISPI development, such as neuropsychotherapy, is judicious. A neuropsychotherapeutic approach, advocated in this article, differs slightly from CBT in that it refocusses its intention on a more “bottom up” approach to ISPI development but remains within the boundaries of cognitive neuroscience. The proposed model of care theorises that honouring the face to face therapeutic relationship, utilising ISPIs as an adjunct to this process and offering access to a mobile phone application will provide a

solid platform to consistently promote the facilitation of neural pathways that foster wellness over time (Arden, 2010; Grawe, 2007) and thereby maximise outcomes for clients.

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Figure 1. New model of care

Existing Model of Care – traditional approach

Aim: To strengthening the neural connections that promote wellness through one on one counselling

Face to face with therapist

New Model of Care – “bottom-up” neuropsychotherapeutic approach

Aim: To strengthening the neural connections that promote wellness

(Face to face session, therapist subscribes to Internet Supported Psychological Interventions (ISPIs) for client access through mi-brain© website, client downloads mobile phone application called mi-life© – ongoing engagement with presenting issues; feedback to clinician; ongoing contact with therapist to enhance outcomes)

Face to face with therapist (ongoing)



Engagement with ISPI between sessions



Option to access mobile application between sessions

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