

Review

Internet interventions for chronic pain including headache: A systematic review



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ABSTRACT

Chronic pain is a major health problem and behavioral based treatments have been shown to be effective. However, the availability of these kinds of treatments is scarce and internet-based treatments have been shown to be promising in this area. The objective of the present systematic review is to evaluate internet-based interventions for persons with chronic pain. The specific aims are to do an updated review with a broad inclusion of different chronic pain diagnoses and to assess disability and pain and also measures of catastrophizing, depression and anxiety. A systematic search identified 891 studies and 22 trials were selected as eligible for review. Two of the selected trials included children/youth and five included individuals with chronic headache and/or migraine. The most frequently measured domain reflected in the primary outcomes was interference/disability, followed by catastrophizing. Result across the studies showed a number of beneficial effects. Twelve trials reported significant effects on disability/interference outcomes and pain intensity. Positive effects were also found on psychological variable such as catastrophizing, depression and anxiety. Several studies ($n = 12$) were assessed to have an unclear level of risk bias. The attrition levels ranged from 4% to 54% where the headache trials had the highest drop-out levels. However, findings suggest that internet-based treatments based on cognitive behavioural therapy (CBT) are efficacious measured with different outcome variables. Results are in line with trials in clinical settings. Meta-analytic statistics were calculated for interference/disability, pain intensity, catastrophizing and mood ratings. Results showed that the effect size for interference/disability was Hedge's $g = -0.39$, for pain intensity Hedge's $g = -0.33$, for catastrophizing Hedge's $g = -0.49$ and for mood variables (depression) Hedge's $g = -0.26$.

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1. Introduction

Chronic pain is a major health problem with a large impact on the emotional, physical and social functioning of persons as well as society. An estimation of 10–30% adults suffer from chronic pain (Reid et al., 2011). Empirical support has been found for cognitive behavioural therapy (CBT) and acceptance and commitment therapy (ACT), which is a form of CBT, for a variety of chronic pain problems compared to wait-list controls and alternative active treatments (Eccleston et al., 2013; Hann and McCracken, 2014). Unfortunately, the availability of CBT and ACT for chronic pain is poor for many individuals suffering from chronic pain. It is essential to increase the accessibility of evidence-based treatments such as CBT to chronic pain sufferers. For the last decade researchers across the world have investigated the power

of the internet to create internet-based prevention and treatment programmes (Andersson, 2014, 2009). Different methods are used to administer the interventions and to encourage the participants. Guided internet-based programmes provide instructions for behavioural change to the participants while being monitored by a therapist. In contrast, unguided internet-based interventions are websites that are fully automated. Furthermore, there are a great number of apps (downloadable programmes designed to run on the smart phone) relating to pain, but there is no regulatory body evaluating and approving the release of health-care apps (Rosser and Eccleston, 2011).

Several systematic reviews have been performed the last five years, more specific 2010, 2012 and 2014, indicating the rapid development in this area. In a review conducted by Macea et al. (2010), 11 studies were assessed to quantify the efficacy of internet-based CBT (iCBT) for chronic pain. The studies included were randomized controlled trials. The main outcome used in the meta-analysis was pain, and results showed small reductions in pain compared to waiting-list control groups. High dropout rates were reported with an average of 26%, which is higher

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than in traditional CBT interventions (14%). In another review (Bender et al., 2011) 17 articles that evaluated iCBT for chronic pain were included. The total sample analysed consisted of 2503 individuals with different chronic pain syndromes including headache, back pain, musculoskeletal pain, abdominal pain and fibromyalgia. Results showed that iCBT was associated with improvements in pain, activity limitation, and costs associated with treatment. The effects on depression and anxiety were less consistent. A more recent review included fifteen studies with a total sample of 2012 adults with chronic pain. The researchers found positive effects regarding pain intensity, disability, depression and anxiety at post-treatment. It was found that there is insufficient evidence to make conclusions regarding the efficacy of internet-based psychological treatments in participants with headache conditions (Eccleston et al., 2014).

The rapid increase of internet-based studies for chronic pain for adults and children/youth and the technical development and increasing trials for different pain diagnoses including headache motivate a review with a broader perspective on internet-based treatment. The present review aims to do an updated review with a broad inclusion of different chronic pain diagnoses and to include studies with children/youth with chronic pain. The more specific aims are to assess disability and pain and also outcomes of catastrophizing, depression and anxiety are of interest. Furthermore, risk of bias was assessed for the different trials and meta-analytic statistics were calculated for the different outcome variables.

2. Methods

2.1. Identification of studies

This review includes published journal articles describing randomized controlled trials of internet-based CBT for chronic pain. Studies were identified using different sources. Existing systematic reviews in the field were used (Bender et al., 2011; Eccleston et al., 2014; Macea et al., 2010). Furthermore, a search of MEDLINE, PsychINFO, CINAHL and The Cochrane Library was conducted (1990 to March 2015). All searches were carried out on the 23rd of February and 5th of March 2015. Unpublished literature was not sought for the review.

The titles, abstracts and keyword were searched for the following terms: cognitive, cognitive behavioral therapy, CBT, acceptance, ACT, acceptance and commitment therapy, combined with chronic pain, fibromyalgia, FM, persistent pain, back pain, CLBP, musculoskeletal pain, rheumatoid arthritis, chronic headache, headache, and persistent headache and further combined with internet, online, self-help, web-based and also combined with control trial, RCT, and control trial. The aim was to capture efficiently the maximum number of published trials in the field.

2.2. Study selection

Study selection was carried out by the first author and agreed by the other authors. Fig. 1 shows a flow diagram of the study selection process for the review. Inclusion criteria adopted was: 1) randomized controlled trial; 2) article written in English; 3) web-based or mobile phone intervention for the treatment of chronic pain of different types; 4) measurement of disability level and/or pain; 5) treatments that were based on CBT- or ACT principles; and 6) a comparison between an intervention group and a waiting-list control or other treatment. The search yielded a total of 891 articles. When the duplicated articles and the ones that did not fulfill the inclusion criteria were removed, 32 remained. After the full text selection ten articles were excluded since they did not fulfill the inclusion criteria; two were not randomized controlled trials (Kristjánssdóttir et al., 2011; Ljótsson et al., 2014); two studies included samples with pain but not chronic pain (Del Pozo-Cruz et al., 2012; Irvine et al., 2015); two trials were not CBT-based interventions but peer support (Lorig et al., 2008, Lorig et al., 2002); on study did not

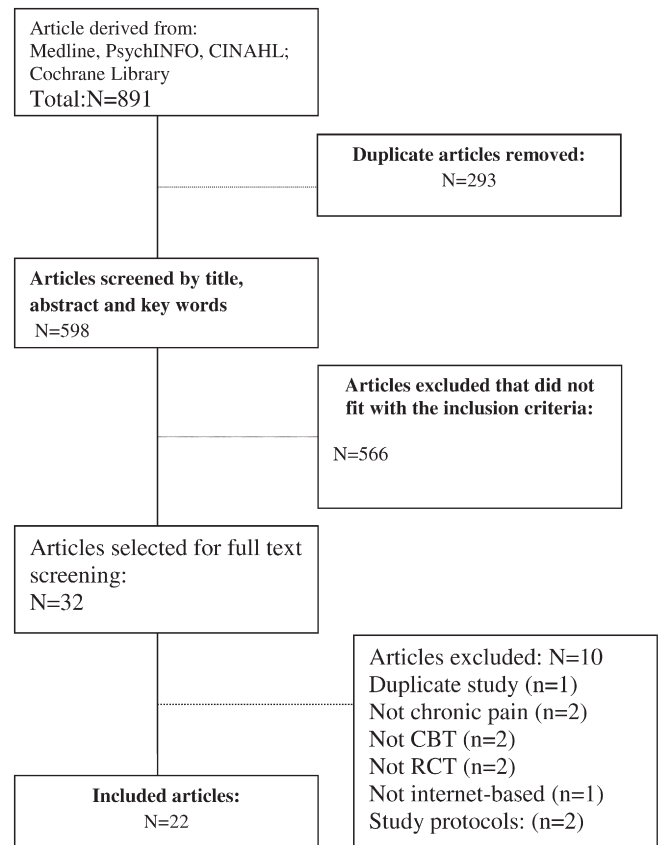


Fig. 1. Flow chart.

include a web-based intervention only telephone administered behavioral treatment (Cottrell et al., 2007); one trial (Fales et al., 2014) included a sample reported in a study already included (Palermo et al., 2009) and two were study protocols (Hayes et al., 2014; Lin et al., 2014) leaving 22 articles that were included. For further information see Fig. 1.

2.3. Data extraction

The first and last authors reviewed independently the full text of articles meeting the eligibility criteria. Data were extracted by the first author and reviewed and agreed by the last one. Data extracted included details of participants' pain condition, sample size, design characteristics, outcome measures, information about the intervention, mean age of participants, educational level of the participants, pain duration, percentage of women, method of treatment delivery, period of treatment, the type of control condition used for comparison, the participants' attrition rate and the results of the outcomes. Primary and secondary outcome information was extracted.

2.4. Data management

The time point for the collection of data was direct after the intervention. Furthermore, the studies' methodological quality was assessed by the reviewers using an adapted Cochrane Collaboration tool for the risk of bias within randomized trials (Higgins et al., 2011).

We relied primarily on guidelines for application of the Cochrane Collaboration tool to assess five areas of potential bias: selection bias, detection bias, attrition bias, reporting bias and other sources of bias. Performance bias was removed since it is difficult to conceal CBT-based treatment from the participants or the therapist. The different areas of potential bias are described in the Results section.

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