

EFFECTIVENESS AND APPLICATION OF REMOTE MENTAL HEALTH INTERVENTIONS TOWARDS COMPENSABLE INJURY RECOVERY

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ABSTRACT

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Abstract

Remote mental health interventions (RMHI) are a developing area of psychological services that have recently gained increased attention in a range of therapeutic treatment settings. One such area is within compensable injury, as a means of providing early intervention and a more extensive range of services to clients in need. The aim of the present research was to examine the evidence-based literature on RMHI, in conjunction with examining existing practices utilised throughout national and international compensation schemes relevant to this form of psychological service delivery. The combined findings from these two components support the fact that RMHI are a relatively new means of mental health service delivery within the compensable injury setting. However, early studies in this field demonstrate effectiveness in the treatment of some mental health issues relevant to post-injury individuals. The most commonly examined and delivered mode of intervention is that of online / internet-based therapy, with the predominant content being based on cognitive-behaviour therapy (CBT) principles. In terms of mental health issues, depression, anxiety and Acute Stress Disorder (ASD) / Post-traumatic Stress Disorder (PTSD) were the main targeted mental health conditions. In terms of application of RMHI in TAC Recovery clients, there are a few considerations to be considered, all of which centre around appropriate pairing of such services to client needs. As it stands, RMHI remain in their early stages of development and thus far, the evidence suggests that its most appropriate application is amongst those experiencing mild to moderate symptomatology. For those with more severe presentations, RMHI can offer an adjunct to traditional means of face-to-face individual therapy with a psychologist. However, this does not limit the potential for future RMHI to play a greater role in mental health treatment, reducing the burden of psychological issues in the overall compensation claims process. Future studies conducted to evaluate the effectiveness in terms of symptom reduction and cost-benefit outcomes of such interventions within a compensable injury population will assist in determining a more defined structure with clearer pathways towards the most appropriate interventions for TAC clients.

Keywords:

Remote mental health interventions (RMHI); psychological services; compensable injury; online / internet-based services, CD / computer-based services; telephone-based services; paper-based services; mental health

The views expressed are those of the authors and do not necessarily represent those of the sponsors, Monash University.

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EXECUTIVE SUMMARY

INTRODUCTION

The psychological functioning and wellbeing of some people injured in road and workplace accidents is compromised. This can manifest as reduced motivation to seek, utilise and persist with appropriate treatment services, representing a significant barrier toward recovery for clients. For compensation schemes worldwide, the ability to offer clients a range of effective psychological treatment services or interventions is a valuable way to achieve desired outcomes.

The relationship between the experience of injury, and subsequent mental health related problems that present in clients at the Transport Accident Commission (TAC) has been observed and documented. Such claims impact the TAC significantly across three overall performance indicators, these being client experience, client outcomes and scheme viability. In order to address this impact, the TAC are actively investigating a variety of mental health intervention avenues with the potential to reduce symptom severity in their population group, whilst simultaneously promoting return to health and return to work outcomes.

The current report encompasses a review of one such mental health intervention prospect; namely, *remote mental health interventions (RMHI)*. As part of the TAC 2015 project, this review was compiled from available research evidence and existing practices within the field of injury compensation. It provides a multi-faceted examination of the current, as well as potential applications of remote mental health interventions, with a particular focus on its effectiveness in compensable injury settings.

The overall aim of the study was to evaluate the available evidence surrounding the effectiveness of “remote mental health interventions” through the following objectives:

- Evaluation of the available literature in the area of remote mental health interventions, through the conduct of a systematic review to identified evidence-based best practice outcomes;
- A review of worldwide national and international compensation schemes and their current practices in offering psychological services related to their mental health claims; and
- Application of both scientific research and current practices to provide recommendations to the TAC regarding how best to manage the increasing claims that contain a psychological component as a barrier to client recovery.

METHOD

The review comprised of two main components that were completed to identify both the evidenced-based practice literature available in the area of remote mental health interventions, as well as the practical applications of psychological service delivery across national and international compensation schemes. This was done so through 1) a systematic review on remote mental health interventions and 2) a National and International Compensation Schemes survey, respectively. Findings from these two components were utilised to inform potential implementation options relevant to the Transport Accident Commission, Recovery Scheme.

RESULTS

In the systematic review, a total of 12 remote mental health interventions were identified as effective across all of the studies. These interventions included:

- **MoodGYM**: Online CBT designed to target **depression** symptoms.
- **BluePages**: Psycho-education website designed to target **depression** symptoms.
- **Overcoming Depression on the Internet (ODIN)**: Online CBT, self-help program designed to target **depression** symptoms.
- **Tetris**: Computer-based game designed to target **Acute Stress Disorder (ASD)** symptoms.

- **Trauma Information Booklet:** Paper-based information booklet designed to target **Acute Stress Disorder (ASD)** and **Post-traumatic Stress Disorder (PTSD)** symptoms.
- **Alcohol Screening and Brief Intervention:** Web-based assessment and intervention designed to target **alcohol abuse** symptoms.
- **Deprexis:** Online CBT-based exercises designed to target **depression** symptoms.
- **Down Your Drink (DYD):** Online self-help program with assessment and support, designed to target **alcohol abuse** symptoms.
- **Blues Begone:** Online CBT program designed to target **depression** and **anxiety** symptoms.
- **Chronic Pain Management:** Online program designed to target **pain**, **depression** and **anxiety** symptoms.
- **Internet-based CBT (by Trimbos Institute, The Netherlands, Institute of Mental Health and Addiction):** Online-CBT program designed to target **depression** symptoms.
- **Personal Control/Mastery (MC):** Phone-based intervention targeting **depression** symptoms.
- **Mindful Awareness/Acceptance (MA):** Phone-based intervention targeting **depression** symptoms.

The results from the assessment of the studies indicate that the above interventions all demonstrated a medium to high level of clinical significance (with the exception of Personal Control/Mastery and Mindful Awareness/Acceptance where effectiveness level could not be determined), therefore indicating that these interventions were able to reduce symptom severity within the study population. Based on these findings, non-clinician based remote interventions are likely to be most readily available and effective for treatment of depression symptoms. It is however, important to consider the level of severity of these symptoms. From the identified studies, participants were more likely to experiment mild to moderate levels of depression, therefore indicating the effectiveness results are most applicable to this level of symptom presentation. This translated across the other treatment conditions also. This suggests that non-clinician based remote mental health interventions are likely to be most effective for the treatment of mild to moderate symptoms.

Findings from the National and International Compensation Schemes survey demonstrate that traditional forms of face-to-face psychological therapies remain the most prominent mental health interventions provided to compensation clients currently. However, there is indication from the results that remote mental health interventions are beginning to surface in the suite of psychological services available to clients in compensable injury settings, worldwide. Given the early stages of its implementation within compensation schemes, exploration of different avenues in this area is still required, in order to assist with developing a more diverse range of services that can be offered to clients at different stages of their claims process. In addition to this, further evaluations of evidence for its effectiveness in such settings may benefit and assist with future implementation of remote mental health interventions.

Other issues that were identified through this survey include the need for effective screening methods utilised with clients. Screening of clients is paramount in determining appropriately, the needs of clients that come through the claims process. The survey suggests that at present, many compensation schemes worldwide still require further development in their screening process in order to accurately identify client needs, and subsequently pair them with appropriate services.

DISCUSSION AND CONCLUSIONS

In summary, the results of the remote mental health interventions review suggest that non-clinician based remote mental health interventions can be effective in the treatment of a range of mental health problems associated with post-injury trauma. However, such effectiveness will be dependent upon appropriate consideration and matching of client symptom severity, needs and abilities to that of the established intervention. This approach will also require continued review if implemented, in parallel with the continuing development of scientific evidence to support this new and developing area of psychological treatment known as “remote mental health”.

1.0 OVERVIEW AND BACKGROUND

1.1 CONTEXT OF REPORT

The psychological functioning and wellbeing of some people injured in road and workplace accidents is compromised. This can manifest as reduced motivation to seek, utilise and persist with appropriate treatment services, representing a significant barrier toward recovery for clients. For compensation schemes worldwide, the ability to offer clients a range of effective psychological treatment services or interventions is a valuable way to achieve desired outcomes.

The relationship between the experience of injury, and subsequent mental health related problems that present in clients at the Transport Accident Commission (TAC) has been observed and documented. Such claims impact the TAC significantly across three overall performance indicators, these being client experience, client outcomes and scheme viability. In order to address this impact, the TAC are actively investigating a variety of mental health intervention avenues with the potential to reduce symptom severity in their population group, whilst simultaneously promoting return to health and return to work outcomes.

The current report encompasses a review of one such mental health intervention prospect; namely, *remote mental health interventions (RMHI)*. As part of the TAC 2015 project, this review was compiled from available research evidence and existing practices within the field of injury compensation. It provides a multi-faceted examination of the current, as well as potential applications of remote mental health interventions, with a particular focus on its effectiveness in compensable injury settings.

1.2 THE TAC 2015 STRATEGY

The TAC is currently in the process of implementing the TAC2015 six-year strategy, which encompasses refining and developing major aspects of TAC's operations: claims management, road trauma prevention, capital management, and IT systems and support. More specifically, the focus of TAC 2015 is to achieve improvements in three key areas: client outcomes, client experience and scheme viability. There are two key claims initiatives that form part of the TAC 2015 strategy: Recover and Independence. These two branches provide support for the mild to moderately injured, and those that are severely injured in road traffic accidents, respectively. The current project was one of several initiatives targeting the Recovery branch, addressing the area of early mental health intervention and support, to reduce adverse consequences associated with client outcomes at a later point in the claims process.

1.2.1 THE RECOVERY CLAIMS INITIATIVE

The focus of the Recovery Claims Initiative is to improve return to work rates and help these TAC clients resume their normal routine as soon as possible. There are three characteristics that underpin the Recovery project, which apply to every Recovery claim:

- Recovery from an accident is about more than just the injury;
- Individual client, individual needs, individual outcomes; and
- Early, proactive and effective interventions.

Previously known as the Benefit Delivery claims model, the new Recovery model introduces the notion of active claims management, to support clients on their journey towards return to work and health. The significant outcomes the model aims to achieve include:

- Holistic management of client complexity;
- Introduction of early intervention, targeted review and evidence based tools;
- Aligning resources, services and liability approach to client needs; and

- Aligning external stakeholders to client outcomes, with a particular focus on vocational and network providers.

In order to actualise and achieve the proposed outcomes, the TAC has commissioned a suite of projects, specifically designed for the Recovery Initiative. The assessment, development and evaluation of the “client Conversation Tool” (CCT) constitute one component of this suite. A key mechanism within the Recovery Team’s Claims process is the early and repeated application of the CCT, as a means of identifying clients at higher risk of experiencing concerns surrounding persistent pain, mental health and return to work (RTW) through their increased service utilisation (Fitzharris, Shourie, & Collie, 2012). Of these clients, individuals who present with issues in all three domains have a tendency to have the poorest outcomes, and contribute to the greatest costs for the TAC, relative to other groups within the Recovery branch (see Figures 1 and 2).

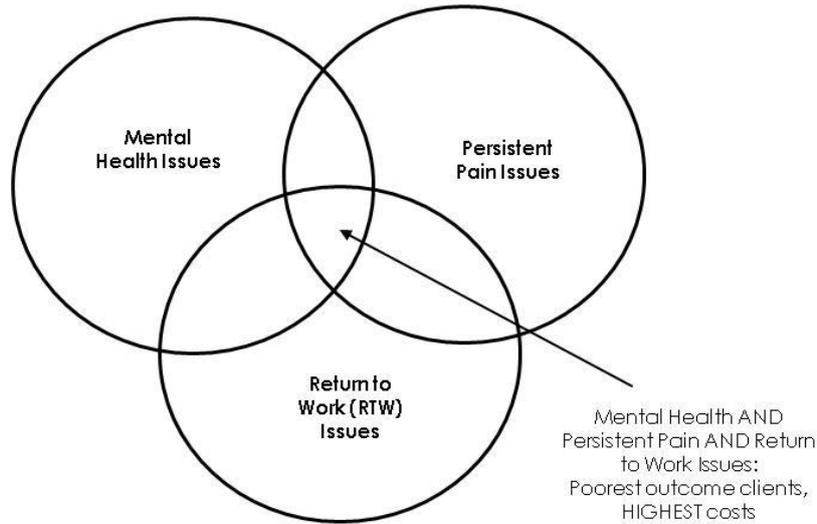
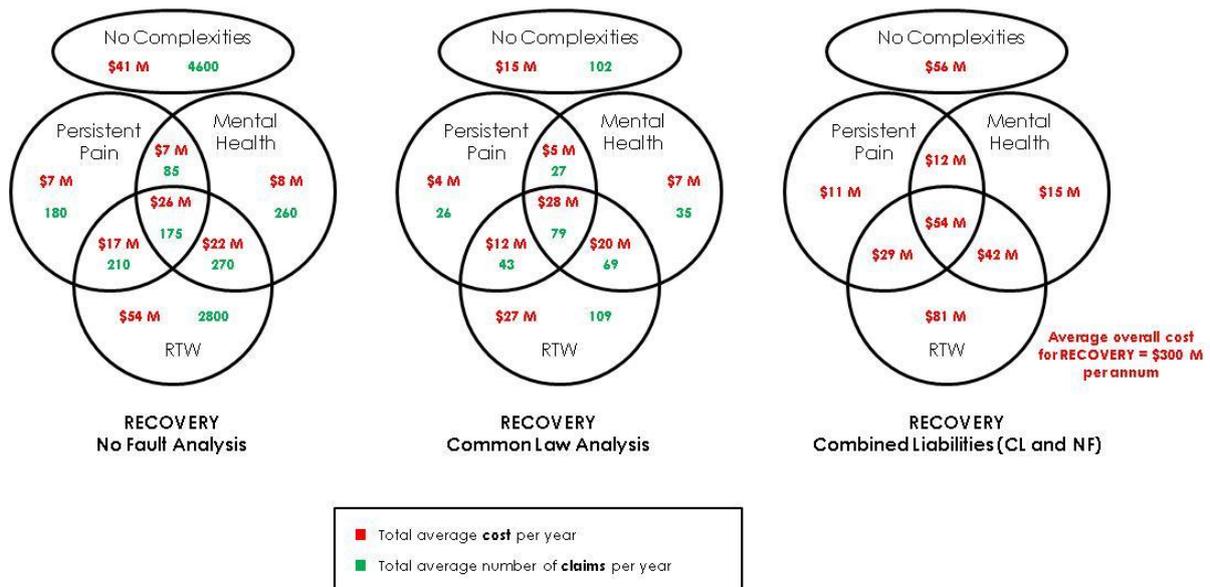


Figure 1 Client issues in the TAC Recovery Scheme



Source: Transport Accident Commission (2011)

Figure 2 Outline of the total average costs and claims per year within Recovery

Following identification of at risk clients via the CCT, effective intervention and support services are then required to be delivered based on the needs profiles of clients. Statistics demonstrate that TAC claims with a psychological component have increased dramatically from approximately 36% in the financial year of 2000/01 to over 80% in the financial year of 2008/09 (Health Services Group, 2010). These numbers continue to escalate in the present day; highlighting the need for developments in parallel psychological services to cater for the needs of these clients. In response to this gap, the TAC and more specifically, the Recovery branch have scoped the current project to explore the potential for implementing RMHI as a means of early intervention for clients at high risk of developing psychological issues at a later stage in their claims process.

1.2.2 THE TAC MENTAL HEALTH STRATEGY

The Health Disabilities Services Group (HDSG), formerly known as the Health Services Group (HSG) has been responsible for developing a mental health framework that underlies the provisions of psychological services for TAC clients. For a complete review of the mental health strategy, see Health Services Group (2010).

1.3 THE CURRENT PROJECT

The current project focuses on exploring the concept of “remote mental health”, and the respective application of such services offered through this delivery domain. It is important to evaluate and understand the available research literature and evidence underlying interventions of this nature. Moreover, implications surrounding the effectiveness, applicability and feasibility of identified interventions to TAC Recovery clients will need to be determined.

1.3.1 AIMS AND OBJECTIVES

The overall aim of the study was to evaluate the available evidence surrounding the effectiveness of “remote mental health interventions” through the following objectives:

- Evaluation of the available literature in the area of remote mental health interventions, through the conduct of a systematic review to identified evidence-based best practice outcomes;
- A review of worldwide national and international compensation schemes and their current practices in offering psychological services related to their mental health claims; and
- Application of both scientific research and current practices to provide recommendations to the TAC regarding how best to manage the increasing claims that contain a psychological component as a barrier to client recovery.

1.3.2 SCOPE

For the purpose of this research project, the focus will be maintained on remote mental health interventions that focus specifically on four modes of delivery: online / internet-based, CD / computer-based, telephone-based or paper-based delivery modes. These will be described in greater detail in the next section. Furthermore, the primary target population of interest will be individuals with mental health issues, within a compensable injury setting. Where applicable, both national and international literature will be examined. The focus is to provide an extensive synthesis of available information in the specified area of remote mental health utilising both academic research and current practices.

2.0 SYSTEMATIC REVIEW

2.1 INTRODUCTION

Traditional approaches to psychological therapy treatments were often delivered in person, where the client presents face-to-face with a clinician. In more recent times however, advances in technology have fostered the development of alternative modes of treatment delivery, namely the emergent concept of 'remote mental health'. At present, there is no distinct, agreed upon definition for this concept however, the literature in this area includes research pertaining to a range of therapeutic interventions that are delivered outside the traditional face-to-face format. Therefore, for the purpose of this research report, 'remote mental health' will be consistent with this definition.

Along with changes in the options for service delivery modes, interventions are also gradually being adapted in a way that can facilitate remote delivery. For example, at present, literature in this field often examines E-therapies (Electronic therapies), that present modules created based on Cognitive-Behavioural Therapy (CBT) principles (Foroushani, Schneider, & Assareh, 2011; Robinson et al., 2010). Whilst a significant amount of research has been identified to support the effectiveness of CBT on some mental health conditions such as depression and anxiety (Driessen & Hollon, 2011; Otte, 2011), it is uncertain how such principles may apply in a remote delivery context.

Based on this, the rationale for the current research is identified. Before implementation and provision of remote mental health interventions can be advocated by the TAC, and offered to their clients, there is a need to determine the existing evidence for such treatment options. More specifically, the focus of such an investigation will be on 'effectiveness levels', both in the context of treatment of mental health conditions, as well as related implementation costs relative to outcomes received. It was therefore proposed that a systematic review would be the first step in addressing this identified need. By conducting a systematic review of defined remote mental health interventions, an assessment of where the evidence currently stands for this newly developing area of potential mental health treatment can be made.

2.1.1 RESEARCH QUESTION

The research question for the systematic review was formulated using the PICO principle, which identifies four essential components:

- P (participant/patient/problem): **Road trauma injured participants**
- I (intervention – exposure, diagnostic test, prognostic factor, etc): **Non-clinician delivered remote mental health interventions**
- C (comparison group or intervention, if relevant): **No treatment, or treatment as usual**
- O (outcome): **Reduced symptoms in identified mental health conditions**

Based on the PICO principle, the research question scoped for the systematic review was defined as: "**Are non-clinician delivered remote mental health services effective in the treatment of mental health conditions experienced post-road trauma injury, relative to no treatment, or treatment as usual?**" Each component of this research question was defined specifically.

Remote mental health services were defined by their mode of delivery, or the means by which the service or intervention is provided to the individual. For the purpose of this review, four delivery modes were included and investigated:

- Internet or online-based intervention;
- CD or computer-based intervention (i.e. does not require internet services);
- Telephone-based intervention, and
- Paper-based intervention.

For the purpose of this review, interventions that required delivery via a clinician were excluded from the study (see Section 2.2 – Inclusion and Exclusion Criteria). This was done on the basis that if seen to be effective, the interventions could be recommended to injured clients by the Transport Accident Commission.

Mental health conditions experienced post-road trauma injury was defined to include a range of mental health conditions that have the potential to present post road trauma injury. The included conditions were:

- Depression;
- Anxiety;
- Travel Phobia;
- Acute Stress Disorder (ASD);
- Post-traumatic Stress Disorder (PTSD);
- Substance Abuse/Alcohol Abuse, and
- Pain.

Through the conduct of the literature search, it was evident that there were few studies limited to road trauma populations. The implications of this evidence gap will be discussed in Section 4.0 (Discussion). In lieu of this, a decision was made to include studies that examined non-injury participants, provided that all other criteria were met. This will be discussed in greater detail in Section 2.0 (Method).

In summary, although the results on intervention effectiveness will need to be interpreted with caution by the TAC, it remains that the results will offer valuable insights into the effectiveness of remote mental health interventions that could then be of value to a road trauma population.

2.1.2 AIMS AND OBJECTIVES

The overall aim of the systematic review was to address the research question of whether non-clinician based mental health services are effective in the treatment of mental health conditions experienced post-road trauma injury, relative to no treatment, or treatment as usual. More specifically, the systematic review focused on answering the following objectives:

- Which non-clinician based remote mental health services are effective in the treatment of the mental health conditions outlined?
- Of the interventions found to be effective in treatment, what size is the treatment effect and how clinically significant is this outcome?
- Of the interventions found to be effective, how feasible will it be for the TAC to implement them in their claims model, relative to return to health and return to work gains?

The systematic review will provide a synthesis of existing scientific evidence to address the individual objectives and subsequently, overall aim of the research proposed.

2.2 METHOD

2.2.1 SEARCH STRATEGY

A scientific literature search was conducted through four specified databases: Medline, Embase, The Cochrane Library and PsycINFO. A further search for grey literature was conducted through Scopus, Web of Science and Google Scholar. The search terms used in the strategy incorporated injury, intervention mode, intervention type and treatment condition. See Appendix A for a full set of search term combinations utilised within each database search.

Results of all searches were imported into Endnote, where duplicate papers were removed. Of the full set of returned articles (with duplicates removed), one reviewer initially screened the titles and abstracts for potential relevance. Of these potentially relevant articles, two reviewers each screened the full-texts to determine article

that met the criteria to be included in the final set. Disagreements between reviewers were resolved by consensus. Figure 1 illustrates the outcomes from the search strategy applied.

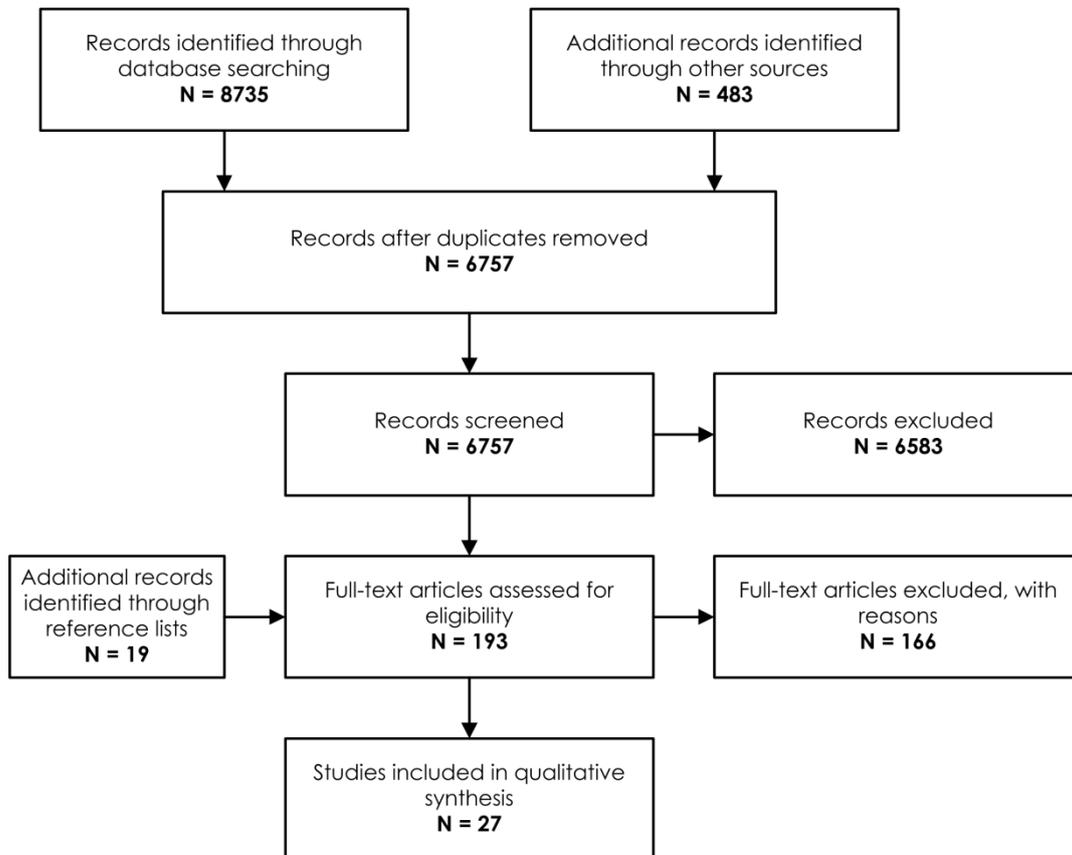


Figure 3 Summary of search outcomes produced from the search strategy

2.2.2 INCLUSION AND EXCLUSION CRITERIA

The review was limited to studies available in full-text and published in English from 2002 to 2012 (inclusive). Articles were selected for inclusion according to the following criteria:

- The intervention service targets specified mental health conditions (or symptoms of the conditions);
- The mode of delivery was one of the specified remote modes (i.e. does not require face to face/in person contact), and
- The intervention service provided was not delivered by a clinician.

Articles that failed to meet the above criteria were excluded. Study Protocols were also excluded from the final set, as well as interventions designed to prevent, rather than treat specified mental health conditions and their associated symptoms.

2.2.3 ASSESSMENT OF INCLUDED STUDY

Included studies were summarised and assessed for characteristics, findings and quality in order to evaluate the overall effectiveness value of examined interventions. Based on the assessment of a range of variables within each domain, an overall conclusion was determined for “overall effectiveness”.

2.2.3.1 STUDY CHARACTERISTICS

For each study, a range of characteristics were summarised to provide a context for comparison across studies. The following characteristics were contrasted between each study:

- **Country of Origin:** Country where the study was conducted;
- **Intervention(s):** Type of intervention examined;
- **Mode(s) of Delivery:** The means by which the intervention is provided to the participant(s);
- **Treatment Condition(s):** Mental health condition(s) that the intervention(s) targets;
- **Previously Sustained Injury:** Whether the participant(s) population had pre-morbid physical injury;
- **Participant(s):** A description of the participant population in the study, and
- **Aim(s)/Hypotheses:** The overall goal of the study, and in particular, the predicted outcomes of the study or hypotheses.

2.2.3.2 STUDY FINDINGS

The results of the included studies were summarised and assessed according to the main outcome measures relevant to the systematic review research question. More specifically, the variables evaluated included:

- **Outcome Measure Tools:** The tools used to measure the main outcome measures were listed.
- **Statistical Significance:** Whether the statistical analysis identified a significant effect of intervention, in contrast to no intervention.
- **Effect Size:** For those findings that were found to be statistically significant, where reported, effect sizes were documented for comparison.
- **Rate of Improvement:** For those interventions that were found to be effective, clinical significance was assessed by identifying the rate of symptom reduction in the main outcome measures based on pre- and post-intervention assessments or control versus intervention groups.
- **Clinical Significance:** An overall assessment of the level of clinical significance was summarised based on changes in symptom presentation, and improved mental health. If the rate of improvement (or level of symptom reduction) was found to be > 20%, this was deemed as “high” treatment effectiveness. Improvement rates that fall between 10% and 20% were considered to have “medium” treatment effectiveness. For improvements that were < 10%, treatment effectiveness was concluded as being “low”.

2.2.3.3 QUALITY ASSESSMENT

The assessment of study quality was completed, based on a range of criteria designed to assess both internal and external validity of study findings. The following criteria were assessed for each included study:

- **Level of Evidence:** Level of evidence refers to the design of the study and the hierarchy at which the design sits. The levels have been proposed to reflect ‘effectiveness of the study’, defined as the probability that the design of a study has the ability to reduce or eliminate bias from the results. Table 1 illustrates the hierarchy of study designs that contribute to level of evidence.

Table 1 Level of Evidence

Level of Evidence	Study Design
I	Evidence obtained from a systematic review of all relevant randomised controlled trials.
II	Evidence obtained from at least one properly-designed randomised controlled trial.
III-1	Evidence obtained from well-designed pseudo-randomised controlled trials (alternate allocation or some other method).
III-2	Evidence obtained from comparative studies (including systematic review of such studies) with concurrent controls and allocation not randomised, cohort studies, case-control studies, or interrupted time series with a control group.
III-3	Evidence obtained from comparative studies with historical control, two or more single arm studies, or interrupted time series without a parallel control group.
IV	Evidence obtained from case series, either post-test or pre-test / post-test.

Source: NHMRC (1999)

- Quality of Evidence (Bias Assessment):** The bias assessment involves an evaluation of the methodological quality. Therefore, an assessment of the likelihood that bias, confounding and/or chance may have influenced the results. The Cochrane classification for assessing bias was utilised. Table 2 provides a description of the types of bias considered in the assessment of internal validity of each study. It is important to note that the Cochrane classification for assessing bias is aimed at Randomised Controlled Trials (RCT) specifically however, the same types of bias can still be considered when assessing other study designs.

Table 2 Cochrane Assessment of Bias

Type of Bias	Description	Relevant Domains to Consider
Selection Bias	Systematic differences between baseline characteristics of the groups that are compared.	Sequence generation Allocation concealment
Performance Bias	Systematic differences between groups in the care that is provided, or in exposure to factors other than the interventions of interest.	Blinding of participants, personnel and outcome assessors. Other potential threats to validity.
Attrition Bias	Systematic differences between groups in withdrawals from a study.	Incomplete outcome data. Blinding of participants, personnel and outcome assessors.
Detection Bias	Systematic differences between groups in how outcomes are determined.	Blinding of participants, personnel and outcome assessors. Other potential threats to validity.
Reporting Bias	Systematic differences between reported and unreported findings.	Selective outcome reporting.

Source: Higgins and Green (2009)

- External Validity:** The external validity assessment involved an evaluation of the application and generalisability of the results from what was identified in the study, to how the results may appropriately be translated in real world settings for the target population. It examines aspects such as sampling methods or population representation, overall compliance to the intervention, and other potential extraneous variables. External validity was assessed based on a consideration of the study as a whole, categorised as having “minor issues”, “moderate issues” or “severe issues” related to the ability for application and generalisation in real world settings.

2.2.3.4 OVERALL EFFECTIVENESS

As discussed in the scoping of the systematic review research question, there are two aspects of effectiveness that the research is interested in determining. This includes:

- **Treatment Effect:** This refers to an evaluation of both the findings from the study, as well as a critical quality assessment of both internal and external validity considerations associated with the study. In other words, the determined level of treatment effect will be based on how likely findings from the study demonstrate a true result of the intervention investigated. This consideration will lead to a low, medium or high level of treatment effect, if such an intervention were to be used for treatment.
- **Cost Effectiveness:** This refers to the feasibility of implementing the investigated intervention, relative to the clinical effect size of the desired outcome. Although a cost-benefit analysis is outside the scope of this current review, the cost effectiveness judgement is directed at providing an indication of low, medium or high levels of cost effectiveness, if such an intervention were to be used for treatment.

2.2.4 DATA EXTRACTION

Data was extracted and assessed from each study for all the variables discussed in Section 2.3 (Assessment of Studies). The assessment was completed by two researchers individually, and results were discussed until consensus was reached. Where consensus could not be established, a third researcher was consulted to determine the outcome of assessment. Findings are presented in Section 3.0 (Results).

2.3 RESULTS

The search strategy identified 6,757 studies of which 6,730 were excluded, leaving 27 studies for inclusion and assessment. The results are presented across a series of tables that outline the study characteristics, study findings, quality assessment and overall effectiveness for each of the studies. Of the included studies, there were some studies that reported on the same intervention. Although the results are reported individually for each study, an integrated discussion will be provided on individual intervention effectiveness.

2.3.1 STUDY CHARACTERISTICS

Table 3 summarises the characteristics of the 27 included studies. These studies originated from six countries including Australia, Germany, The Netherlands, New Zealand, The United Kingdom and The United States. In terms of mode of delivery, the predominant number of studies assessed internet/online-based interventions, however four paper-based interventions, one CD/computer-based intervention and one phone-based intervention were also identified. Within the specified treatment conditions of interest, all conditions were examined across the 27 identified studies, with the exception of *travel phobia* and *substance abuse* (although substance abuse presented co-morbidly with the primary treatment condition in at least one study examined). However, depression was the most commonly investigated target treatment condition identified in this review. Participants across the range of studies included child, adolescents, adults and older adults. Based on a review of the study characteristics associated with the 27 included studies, there is demonstrated variation across intervention delivery modes, treatment conditions as well as participant population (across different ages and countries). This provides a rich source of information in answering the systematic review research question.

Table 3 Study Characteristics Summary

	COUNTRY OF ORIGIN	INTERVENTION(S)	MODE(S) OF DELIVERY	TREATMENT CONDITION(S)	PREVIOUSLY SUSTAINED INJURY	PARTICIPANT(S)	AIMS(S)
STUDY AND TITLE							
Berman et al. (2009) The effectiveness of an online mind-body intervention for older adults with chronic pain	United States	Intervention Group Self-care pain management project: online mind-body intervention Versus Control Group Wait list	Internet/Online -based Intervention	Pain	Yes (Some participants) *Note: Injury type not specified.	Older Adults 55 years and older N = 78 Intervention Group (n = 52) and Control Group (n = 37)	The aims of the study were “to assess the feasibility of delivering the self-care tools to older adults via the internet and to document changes in pain and ability to manage chronic pain”.
Bugg et al. (2009) A randomised controlled trial of the effectiveness of writing as a self-help intervention for traumatic injury patients at risk of developing post-traumatic stress disorder	United Kingdom	Intervention Group Self-help writing Versus Control Group Information booklet	Paper-based Intervention	Acute Stress Disorder (ASD) Post-traumatic Stress Disorder (PTSD)	Yes (Road traffic accident, occupational injury or assault)	Adults 18 to 65 years N = 148 Intervention Group (n = 72) and Control Group (n = 76)	The aim of the study was to “test the effects of writing on severity of psychological symptoms in traumatic injury patients at risk of developing PTSD”.
Christensen et al. (2002) Web-based cognitive behaviour therapy: Analysis of site usage and changes in depression and anxiety	Australia	Intervention Group MoodGYM (internet-based cognitive behaviour therapy) *Note: No control group was included.	Internet/Online -based Intervention	Depression Anxiety	Not Reported	Children, Adolescents, Adults, Older Adults 10 to 80 years N = 2909	The aim of the study was to “document site usage, visitor characteristics, and changes in depression and anxiety symptoms among users of MoodGYM”

	COUNTRY OF ORIGIN	INTERVENTION(S)	MODE(S) OF DELIVERY	TREATMENT CONDITION(S)	PREVIOUSLY SUSTAINED INJURY	PARTICIPANT(S)	AIMS(S)
STUDY AND TITLE							
Christensen et al. (2004) Delivering interventions for depression by using the internet: Randomised controlled trial	Australia	Intervention Group 1 MoodGYM (internet-based cognitive behaviour therapy) Versus Intervention Group 2 Versus BluePages (psycho-education website) Versus Control Group Attention placebo	Internet/Online -based Intervention	Depression	Not Reported	Adults 18 to 52 years N = 525 Intervention Group 1 (n = 182), Intervention Group 2 (n = 166) and Control Group (n = 178)	The aim of the study was to “evaluate the efficacy of two internet interventions for community-dwelling individuals with symptoms of depression”.
Christensen et al. (2004) A comparison of changes in anxiety and depression symptoms of spontaneous users and trial participants of a cognitive behaviour therapy website	Australia	Intervention Group MoodGYM (internet-based cognitive behaviour therapy) *Note: No control group was included.	Internet/Online -based Intervention	Depression Anxiety	Not Reported	Unclear/Not Reported	The aim of the study was to “compare anxiety and depression outcomes for spontaneous visitors to a publicly accessible cognitive behaviour therapy website (MoodGYM) with outcomes achieved through a randomised controlled efficacy trial of the same site”

	COUNTRY OF ORIGIN	INTERVENTION(S)	MODE(S) OF DELIVERY	TREATMENT CONDITION(S)	PREVIOUSLY SUSTAINED INJURY	PARTICIPANT(S)	AIMS(S)
STUDY AND TITLE							
Christensen et al. (2006) Online randomised controlled trial of brief and full cognitive behaviour therapy for depression	Australia	Intervention Group MoodGYM (internet-based cognitive behaviour therapy) Versus Control Group Treatment as usual *Note: This study examined variations in different components of the program (a total of 6 versions were evaluated)	Internet/Online -based Intervention	Depression	Not Reported	Unclear/Not Reported Note: The age range of participants was not reported. N = 2794 Version 1 (n = 464), Version 2 (n = 468), Version 3 (n = 465), Version 4 (n = 463), Version 5 (n = 466) and Version 6 (n = 468)	The aim of the study was to “investigate the parameters that influence open access website use and retention”.
Clarke et al. (2002) Overcoming depression on the internet (ODIN): A randomised controlled trial of an internet depression skills intervention program	United States	Intervention Group ODIN (overcoming depression on the internet, internet-based cognitive therapy, self-help program) Versus Control Group Treatment as usual	Internet/Online -based Intervention	Depression	Not Reported	Adults Note: The age range of participants was not reported. N = 299 Intervention Group (n = 144) and Control Group (n = 155)	The aim of the study was to “evaluate the effectiveness of a web-based intervention program to reduce depression in randomised controlled trial”.

	COUNTRY OF ORIGIN	INTERVENTION(S)	MODE(S) OF DELIVERY	TREATMENT CONDITION(S)	PREVIOUSLY SUSTAINED INJURY	PARTICIPANT(S)	AIMS(S)
STUDY AND TITLE							
<p>Clarke et al. (2005) Overcoming depression on the internet (ODIN) (2): A randomised trial of a self-help depression skills program with reminders</p>	United States	<p>Intervention Group 1 ODIN (overcoming depression on the internet, internet-based cognitive therapy, self-help program) with telephone reminders Versus Intervention Group 2 ODIN (overcoming depression on the internet, internet-based cognitive therapy, self-help program) with postcards Versus Intervention Group 3 Treatment as usual</p>	Internet/Online -based Intervention	Depression	Not Reported	<p>Adults Note: The age range of participants was not reported. N = 335 Intervention Group 1 (n = 80), Intervention Group 2 (n = 75) and Control Group (n = 100)</p>	The aim of the study was to “evaluate the effectiveness of a web-based intervention program, with reminders, to reduce depression in a randomised trial”.
<p>Clarke et al. (2009) Randomised effectiveness trial of an internet, pure self-help, cognitive behavioural intervention for depressive symptoms in young adults</p>	United States	<p>Intervention Group Internet-delivered, cognitive behavioural skills training program Versus Control Group Treatment as usual</p>	Internet/Online -based Intervention	Depression	Not Reported	<p>Young Adults 18 to 24 years N = 160 Intervention Group (n = 83) and Control Group (n = 77)</p>	The aim of the study was to “evaluate an internet-delivered, cognitive behavioural skills training program versus a treatment-as-usual control condition targeting depression symptoms in young adults aged 18 to 24 years”.

	COUNTRY OF ORIGIN	INTERVENTION(S)	MODE(S) OF DELIVERY	TREATMENT CONDITION(S)	PREVIOUSLY SUSTAINED INJURY	PARTICIPANT(S)	AIMS(S)
STUDY AND TITLE							
de Graaf et al. (2009) Clinical effectiveness of online computerised cognitive-behavioural therapy without support for depression in primary care: randomised trial	The Netherlands	Intervention Group 1 Colour your life online multimedia, interactive CCBT programme Versus Intervention Group 2 Colour your life online CCBT programme and treatment as usual (by a general practitioner) Versus Control Treatment as usual	Internet/Online -based Intervention	Depression	Not Reported	Adults 18 to 65 years N = 303 Intervention Group 1 (n = 100), Intervention Group 2 (n = 100) and Control Group (n = 103)	The aim of the study was to “determine the clinical effectiveness of online, unsupported CCBT for depression in primary care”.
de Graaf et al. (2011) One-year follow-up results of unsupported online computerised cognitive behavioural therapy for depression in primary care: A randomised trial	The Netherlands	Intervention Group 1 Colour your life online multimedia, interactive CCBT programme Versus Intervention Group 2 Versus Colour your life online CCBT programme and treatment as usual (by a general practitioner) Versus Control Treatment as usual	Internet/Online based Intervention	Depression	Not Reported	Adults 18 to 65 years N = 303 Intervention Group 1 (n = 100), Intervention Group 2 (n = 100) and Control Group (n = 103)	The aim of the study was to “report the one-year follow-up results of computerised cognitive behavioural therapy (CCBT), offered online without professional support, for depression compared with usual CP care and a combination of both treatments, and to explore potential relapse prevention effects of CCBT”.
Holmes et al. (2009) Can playing the computer game “tetris” reduce the build-up of flashbacks for trauma? A proposal from cognitive science	United Kingdom	Intervention Group Tetris Game Versus Control Group No-task	CD/Computer-based Intervention	Acute Stress Disorder (ASD) Post-traumatic Stress Disorder (PTSD)	Not Reported	Adults 18 to 47 years N = 40 Intervention Group (n = 20) and Control Group (n = 20)	The aim of the study was to examine whether “playing Tetris half an hour after viewing trauma would reduce flashback frequency over 1-week”.

	COUNTRY OF ORIGIN	INTERVENTION(S)	MODE(S) OF DELIVERY	TREATMENT CONDITION(S)	PREVIOUSLY SUSTAINED INJURY	PARTICIPANT(S)	AIMS(S)
STUDY AND TITLE							
Kenardy et al. (2003) Information-provision intervention for children and their parents following paediatric accidental injury	Australia	Intervention Group Information booklets with trauma education Versus Control Group Treatment as usual	Paper-based Intervention	Acute Stress Disorder (ASD) Post-traumatic Stress Disorder (PTSD)	Yes (motor vehicle accidents, falls and sporting injuries)	Children 7 to 15 years and Adults (parents of the children) N = 103 Intervention Group (n = 33) and Control Group (n = 70)	The aim of the study was to “evaluate an early intervention for children and their parents following paediatric accidental injury”.
Kypri et al. (2004) Web-based screening and brief intervention for hazardous drinking: A double-blind randomised controlled trial	New Zealand	Intervention Group Screening and brief intervention (web-based assessment and personalised feedback) Versus Control Group Leaflet on health effects of alcohol	Internet/Online -based Intervention	Alcohol Abuse	Not Reported	Young Adults 17 to 26 years N = 104 Intervention Group (n = 51) and Control Group (n = 53)	The aim of the study was to “determine the efficacy of a novel web-based screening and brief intervention (e-SBI) to reduce hazardous drinking”.
Kypri et al. (2008) Randomised controlled trial of web-based alcohol screening and brief intervention in primary care	New Zealand	Intervention Group 1 Single dose e-SBI (web-based motivational intervention) Versus Intervention Group 2 Multi-dose e-SBI (web-based motivational intervention with further interventions) Versus Control Group Information pamphlet	Internet/Online -based Intervention	Alcohol Abuse	Not Reported	Young Adults 17 to 29 years N = 576 Intervention Group 1 (n = 138), Intervention Group 2 (n = 145) and Control Group (n = 146). *Note: An alternative control group, was also randomised for separate analysis, n = 147.	The aim of the study was to “test whether single-dose and multi-dose e-SBI would reduce hazardous drinking”.

	COUNTRY OF ORIGIN	INTERVENTION(S)	MODE(S) OF DELIVERY	TREATMENT CONDITION(S)	PREVIOUSLY SUSTAINED INJURY	PARTICIPANT(S)	AIMS(S)
STUDY AND TITLE							
Kypri et al. (2009) Randomised controlled trial of proactive web-based alcohol screening brief intervention for university students	Australia	Intervention Group THRIVE (Tertiary Health Research Intervention Via Email) – 10 minute web-based motivational assessment and personalised feedback Versus Control Group Screening Only	Internet/Online -based Intervention	Alcohol Abuse	Not Reported	Young Adults 17 to 24 years N = 2435 Intervention Group (n = 1251) and Control Group (n = 1184)	The aim of the study was to “determine the efficacy of a web-based motivational intervention delivered after screening of a large population of undergraduates, with screening alone as the control”.
Mackinnon et al. (2008) Comparative randomised trial of online cognitive-behavioural therapy and an information website for depression: 12-month outcomes	Australia	Intervention Group 1 MoodGYM (internet-based cognitive behaviour therapy) Versus Intervention Group 2 Versus BluePages (psycho-education website) Versus Control Group Attention placebo	Internet/Online -based Intervention	Depression	Not Reported	Adults 18 to 52 years N = 525 Intervention Group 1 (n = 182), Intervention Group 2 (n = 166) and Control Group (n = 178)	The aim of the study was to “determine 6 month and 12 month outcomes of the interventions relative to a placebo control condition”.
Migliorini et al. (2011) Developing and piloting ePACT: A flexible psychological treatment for depression in people living with chronic spinal cord injury	Australia	Intervention Group Electronic Personal Administration of Cognitive Therapy (ePACT), CBT and positive psychology-based intervention *Note: No controls were included.	Internet/Online -based Intervention	Depression Anxiety	Yes (motor vehicle injuries and work-related injury)	Adults 41 to 65 years *Note: 3 cases in total (65, 53 and 41 years) N = 3	The aim of the study was to “develop and pilot a flexible online psychological treatment using CBT and positive-psychology based techniques, for individuals with spinal cord injury (SCI) who also lived with depression or both depression and anxiety”.

	COUNTRY OF ORIGIN	INTERVENTION(S)	MODE(S) OF DELIVERY	TREATMENT CONDITION(S)	PREVIOUSLY SUSTAINED INJURY	PARTICIPANT(S)	AIMS(S)
STUDY AND TITLE							
Moritz et al. (2012) A randomised controlled trial of internet-based therapy in depression	Germany	Intervention Group Deprexis (CBT-based exercises) Versus Control Group Wait list	Internet/Online -based Intervention	Depression	Not Reported	Adults 18 to 65 years N = 210 Intervention Group (n = 105) and Control Group (n = 105)	The aim of the study was to “assess the efficacy of an online self-help program for depression (Deprexis)”
Murray et al. (2012) Widening access to treatment of alcohol misuse: Description and formative evaluation of an innovative web-based service in one primary care trust	United Kingdom	Intervention Group Web-based self-help programme Down Your Drink (DYD) with assessment and support in using the program *Note: No control group was included.	Internet/Online -based Intervention	Alcohol Abuse	Not Reported	Adults 20 to 68 years N = 19	The aim of the study was to “describe the development and evaluation of an innovative web-based service for hazardous or harmful drinking”.
Purves et al. (2009) An opening trial in the NHS of Blues Begone: A new home based computerised CBT program	United Kingdom	Intervention Group Blues Begone (computerised CBT program) *Note: No control group was included.	Internet/Online -based Intervention	Depression Anxiety	Not Reported	Adults 18 to 65 years N = 100	The aim of the study was to examine whether “BBG would demonstrate a statistically significant change on the primary measures of depression and anxiety”.
Ruehlman et al. (2012) A randomised controlled evaluation of an online chronic pain self-management program	United States	Intervention Group Chronic pain management program Versus Control Group Wait list	Internet/Online -based Intervention	Pain Depression Anxiety	Unclear/Not Reported	Adults, Older Adults 19 to 78 years N = 330 Intervention Group (n = 165) and Control Group (n = 165)	The aim of the study was to test the “efficacy of an online Chronic Pain Management Program, a comprehensive, fully self-directed and self-paced system that integrates social networking features and self-management tools into an interactive learning environment”.

	COUNTRY OF ORIGIN	INTERVENTION(S)	MODE(S) OF DELIVERY	TREATMENT CONDITION(S)	PREVIOUSLY SUSTAINED INJURY	PARTICIPANT(S)	AIMS(S)
STUDY AND TITLE							
Scholes et al. (2007) A randomised controlled trial to assess the effectiveness of providing self-help information to people with symptoms of acute stress disorder following a traumatic injury	United Kingdom	Intervention Group Self-help information booklet (developed by Mark Creamer) on trauma Versus Control Group High-risk No intervention Versus Control Group Low-risk Treatment as usual	Paper-based Intervention	Acute Stress Disorder (ASD) Post-traumatic Stress Disorder (PTSD)	Yes (road traffic accident, occupational injury or assault)	Adults 16 to 65 years N = 392 Intervention Group (n = 116), Control Group High-risk (n = 111) and Control Group Low-risk (n = 120) *Note: 45 participants were excluded from the original n = 165 for the Control Group Low-risk due to sufficient group size established.	The aim of the study was to “test the efficacy of providing self-help information to a high-risk sample”.
Spek et al. (2007) Internet-based cognitive behavioural therapy for sub-threshold depression in people over 50 years old: A randomised controlled clinical trial	The Netherlands	Intervention Group 1 Internet-based cognitive behaviour therapy intervention (by Trimbos Institute, The Netherlands Institute of Mental Health and Addiction) Versus Intervention Group 2 Coping With Depression (CWD) group cognitive behaviour therapy Versus Control Group Wait list *Note: Intervention Group 2 was not relevant to the systematic review question.	Internet/Online -based Intervention	Depression	Not Reported	Older Adults Note: The age range of participants was not reported. N = 301 Intervention Group 1 (n = 102), Intervention Group 2 (n = 99) and Control Group (n = 100)	The aims of the study were to “(1) determine whether an internet-based cognitive behaviour therapy intervention and a group cognitive behaviour therapy intervention are more effective than a waiting-list control group; and (2) determine whether the effect of the internet-based cognitive behaviour therapy differs from the group cognitive behaviour therapy intervention. *Note: The second aim of the study was not relevant to the systematic review research question and was not included in the results reported.

	COUNTRY OF ORIGIN	INTERVENTION(S)	MODE(S) OF DELIVERY	TREATMENT CONDITION(S)	PREVIOUSLY SUSTAINED INJURY	PARTICIPANT(S)	AIMS(S)
STUDY AND TITLE							
Spek et al. (2008) One-year follow-up results of a randomised controlled clinical trial on internet-based cognitive behavioural therapy for sub-threshold depression in people over 50 years	The Netherlands	Intervention Group 1 Internet-based cognitive behaviour therapy intervention (by Trimbos Institute, The Netherlands Institute of Mental Health and Addiction) Versus Intervention Group 2 Coping With Depression (CWD) group cognitive behaviour therapy Versus Control Group Wait list *Note: Intervention Group 2 was not relevant to the systematic review question.	Internet/Online -based Intervention	Depression	Not Reported	Older Adults Note: The age range of participants was not reported. N = 301 Intervention Group 1 (n = 102), Intervention Group 2 (n = 99) and Control Group (n = 100)	The aim of the study was to “(1) determine whether, after 1 year, an internet-based CBT intervention was more effective than a waiting-list control group; and (2) determine whether the effect of the internet-based CBT differed from the group CBT intervention, 1 year after the start of treatment”. *Note: The second aim of the study was not relevant to the systematic review research question and was not included in the results reported.
Turpin et al. (2005) Effectiveness of providing self-help information following acute traumatic injury: Randomised controlled trial	United Kingdom	Intervention Group Self-help information booklet, ‘Responses to traumatic injury’ (by the Psychological Department at Harrogate District Hospital) Versus Control Group Treatment as usual	Paper-based Intervention	Post-traumatic Stress Disorder (PTSD) Depression Anxiety	Yes (road traffic accident, occupational injury or assault)	Adults 16 to 65 years N = 291 Intervention Group (n = 146) and Control Group (n = 145)	The aim of the study was to “assess the efficacy of providing information booklets to patients serially attending an accident and emergency (A&E) department following physical injury.

	COUNTRY OF ORIGIN	INTERVENTION(S)	MODE(S) OF DELIVERY	TREATMENT CONDITION(S)	PREVIOUSLY SUSTAINED INJURY	PARTICIPANT(S)	AIMS(S)
STUDY AND TITLE							
Zautra et al. (2012) Phone-based interventions with automated mindfulness and mastery messages improve the daily functioning for depressed middle-aged community residents	United States	Intervention Group 1 Personal control/mastery (MC) Versus Intervention Group 2 Mindful awareness/acceptance (MA) Versus Control Attention-control treatment	Phone-based Intervention	Depression	Not Reported	Adults, Older Adults 40 to 60 years N = 82 Intervention Group 1 (n = 29), Intervention Group 2 (n = 29) and Control Group (n = 24)	The aim of the study was to examine the “value of two self-help programs that rely on automated instructional materials versus an attention control in a community sample with symptoms of depression”.

*Note: Highlighted studies indicate studies that utilised a population with previously sustained injury.

2.3.2 STUDY FINDINGS

Table 4 summarises the results for the main outcomes of interest across the 27 included studies. Of these, 18 studies demonstrated some level of statistical significance for the targeted outcome measures. More specifically, remote mental health interventions have demonstrated some level of treatment effectiveness for Depression, Anxiety, Alcohol Abuse, Acute Stress Disorder (ASD) / Post-traumatic Stress Disorder (PTSD) and pain. Interestingly, based on the reported results from individual studies, there was support for all four modes of remote delivery, for specific treatment conditions. These results need to be considered with care against the quality assessment of each study to ensure methodological rigour was utilised in producing such outcomes. Of the four forms of remote delivery, internet/online-based interventions received the greatest support from the studies assessed, also influenced by its greater prevalence.

Table 4 Study Findings Summary

	PRIMARY OUTCOME MEASURE TOOLS	STATISTICAL SIGNIFICANCE	EFFECT SIZE	RATE OF IMPROVEMENT	CLINICAL SIGNIFICANCE
STUDY AND TITLE					
Berman et al. (2009) The effectiveness of an online mind-body intervention for older adults with chronic pain	Brief Pain Inventory – Short Form (BPI)	Pain: No	N/A	N/A	N/A
Bugg et al. (2009) A randomised controlled trial of the effectiveness of writing as a self-help intervention for traumatic injury patients at risk of developing post-traumatic stress disorder	Post-traumatic Diagnostic Scale (PDS)	Acute Stress Disorder (ASD) and Post-traumatic Stress Disorder (PTSD): No	N/A	N/A	N/A
Christensen et al. (2002) Web-based cognitive behaviour therapy: Analysis of site usage and changes in depression and anxiety	Goldberg Anxiety and Depression Scales	<p>Depression: Yes Statistically significant reduction in depression scores as individuals progressed through the modules.</p> <p>Anxiety: Yes Statistically significant reduction in anxiety scores as individuals progressed through the modules.</p>	Unclear	<p>Depression: 2.7 pt ↓ (-2.2 to 4.2) ~48% ↓ in symptom severity for those who completed all five modules.</p> <p>Anxiety: 3.3 pt ↓ (-2.3 to 4.2) ~ 56% ↓ in symptom severity for those who completed all five modules.</p>	High

	PRIMARY OUTCOME MEASURE TOOLS	STATISTICAL SIGNIFICANCE	EFFECT SIZE	RATE OF IMPROVEMENT	CLINICAL SIGNIFICANCE
STUDY AND TITLE					
Christensen et al. (2004) Delivering interventions for depression by using the internet: Randomised controlled trial	Centre for Epidemiologic Studies Depression Scale	Depression: Yes Statistically significant reduction in depression symptoms in the MoodGYM intervention compared to the control. Statistically significant reduction in depression symptoms in the BluePages intervention compared to the control. *Note: No statistically significant difference between MoodGYM intervention and BluePages intervention (i.e. the interventions appear comparable).	MoodGYM = 0.4 BluePages = 0.4 Control = 0.1	MoodGYM: Depression ~19% ↓ in symptom severity (4.2 pt ↓) BluePages: Depression ~18% ↓ in symptom severity (3.9 pt ↓)	Medium
Christensen et al. (2004) A comparison of changes in anxiety and depression symptoms of spontaneous users and trial participants of a cognitive behaviour therapy website	Goldberg Depression and Anxiety Scales	Depression: No Anxiety: No	N/A	N/A	N/A
Christensen et al. (2006) Online randomised controlled trial of brief and full cognitive behaviour therapy for depression	Goldberg Depression Scale	Depression: Yes Statistically significant difference in depression scores across different treatment versions (Versions 4 and 5 containing both brief and extended CBT were found to be more effective).	Version 2 (Modules 1 and 5) = 0.20 Version 3 (Modules 1, 4, and 5) = 0.22 Version 4 (Modules 1, 2 and 5) = 0.4 Version 5 (Modules 1, 2, 3 and 5) = 0.34 *Note: Effect sizes were reported relative to Version 1. Versions 2 and 6 were identified as not effective.	MoodGYM Version 4: Depression ~29% ↓ in symptom severity (1.7 pt ↓) MoodGYM Version 5: Depression ~26% ↓ in symptom severity (1.5 pt ↓)	High

	PRIMARY OUTCOME MEASURE TOOLS	STATISTICAL SIGNIFICANCE	EFFECT SIZE	RATE OF IMPROVEMENT	CLINICAL SIGNIFICANCE
STUDY AND TITLE					
Clarke et al. (2002) Overcoming depression on the internet (ODIN): A randomised controlled trial of an internet depression skills intervention program	Centre for Epidemiological Studies Depression Scale (CES-D)	Depression: No	N/A	N/A	N/A
Clarke et al. (2005) Overcoming depression on the internet (ODIN) (2): A randomised trial of a self-help depression skills program with reminders	Centre for Epidemiological Studies Depression Scale (CES-D)	Depression: Yes Statistically significant difference of intervention groups on reducing depression symptoms.	0.2777 standard deviation units	Intervention Group 1 (telephone reminder): Depression ~39% ↓ in symptom severity (12 pt ↓) Intervention Group 2 (postcard reminder): Depression ~40% ↓ in symptom severity (12 pt ↓) Control Group: Depression ~20% ↓ in symptom severity (5.7 pt ↓)	High

	PRIMARY OUTCOME MEASURE TOOLS	STATISTICAL SIGNIFICANCE	EFFECT SIZE	RATE OF IMPROVEMENT	CLINICAL SIGNIFICANCE
STUDY AND TITLE					
Clarke et al. (2009) Randomised effectiveness trial of an internet, pure self-help, cognitive behavioural intervention for depressive symptoms in young adults	Eight-item Patient Health Questionnaire (PHQ) (Depression measure)	Depression: Yes Statistically significant effect of intervention on reducing depression symptoms.	Cohen's D = 0.2 (small effect) *Note: Moderate effect for women Cohen's D = 0.42	Intervention: Depression ~14% ↓ in symptom severity (week 32) Control: Depression ~11% ↓ in symptom severity (week 32) 1.97 pt ↓ in severity symptoms over time *Note: At week 16, reduction is 22% versus 5% in symptom severity, indicating continued exposure to intervention is required to maintain intervention benefit.	Medium
de Graaf et al. (2009) Clinical effectiveness of online computerised cognitive-behavioural therapy without support for depression in primary care: randomised trial	Beck Depression Inventory II (BDI-II)	Depression: No	N/A	N/A	N/A

	PRIMARY OUTCOME MEASURE TOOLS	STATISTICAL SIGNIFICANCE	EFFECT SIZE	RATE OF IMPROVEMENT	CLINICAL SIGNIFICANCE
STUDY AND TITLE					
de Graaf et al. (2011) One-year follow-up results of unsupported online computerised cognitive behavioural therapy for depression in primary care: A randomised trial	Beck Depression Inventory II (BDI-II)	Depression: No	N/A	N/A	N/A
Holmes et al. (2009) Can playing the computer game "tetris" reduce the build-up of flashbacks for trauma? A proposal from cognitive science	Flashback Frequency over 1-week Impact of Event Scale (Clinical symptomatology at 1-week)	Acute Stress Disorder (ASD) and Post-traumatic Stress Disorder (PTSD): Yes Statistically significant effect of Tetris on fewer flashbacks over the week compared to the control group.	Unclear	Flashbacks 3.9 pt difference between intervention and control ~134% more flashback in the control condition (2.3 times more) Impact of Event Scale 7 pt difference between intervention and control ~34% lower symptom severity score	High
Kenardy et al. (2008) Information-provision intervention for children and their parents following paediatric accidental injury	Parent Measures Impact of Event Scale (IES) – Intrusion Subscale	Acute Stress Disorder (ASD) and Post-traumatic Stress Disorder (PTSD): Yes Statistically significant reduction in parents for overall post-traumatic symptoms at 6-month follow-up.	Unclear	Impact of Event Scale (IES) – Intrusion Subscale 7 pt ↓ in the intervention group compared to 5 pt ↓ in the control ~78% lower symptom severity	High

	PRIMARY OUTCOME MEASURE TOOLS	STATISTICAL SIGNIFICANCE	EFFECT SIZE	RATE OF IMPROVEMENT	CLINICAL SIGNIFICANCE
STUDY AND TITLE					
Kypri et al. (2004) Web-based screening and brief intervention for hazardous drinking: A double-blind randomised controlled trial	AUDIT (Alcohol Use Disorders Identification Test) Frequency of drinking (number of drinking days in last 2 weeks) Typical occasion quantity (number of drinks per typical drinking occasion in last 4 weeks) Total consumption (number of drinks in last 2 weeks) Frequency of very episodic heavy drinking (number of episodes of >80g for women and 120g for men in last 2 weeks)	Alcohol Abuse: Yes (on some measures) Statistically significant difference for a reduction in total consumption at 6 weeks. Statistically significant difference for a reduction in frequency of very episodic heavy drinking at 6 weeks. *Note: No other statistically significant result was found on measures at both 6 weeks and 6 months.	Unclear/Incomplete Effect size for “consumption measures” at, 6 weeks = 0.40 6 months = 0.15	Ratio of intervention relative to control: Total Consumption 26% ↓ Very heavy episodes 37% ↓	High

STUDY AND TITLE	PRIMARY OUTCOME MEASURE TOOLS	STATISTICAL SIGNIFICANCE	EFFECT SIZE	RATE OF IMPROVEMENT	CLINICAL SIGNIFICANCE
<p>Kypri et al. (2008) Randomised controlled trial of web-based alcohol screening and brief intervention in primary care</p>	<p>AUDIT (Alcohol Use Disorders Identification Test)</p> <p>Frequency of drinking (number of drinking days in last 2 weeks)</p> <p>Typical occasion quantity (number of drinks per typical drinking occasion in last 4 weeks)</p> <p>Total consumption (number of drinks in last 2 weeks)</p> <p>Frequency of very episodic heavy drinking (number of episodes of >80g for women and 120g for men in last 2 weeks)</p>	<p>Alcohol Abuse: Yes (on some measures)</p> <p>Intervention Group 1: Single-dose e-SBI Statistically significant reduction at on frequency of drinking at 6 months. Statistically significant reduction of total consumption at 6 and 12 months.</p> <p>Intervention Group 2: Multi-dose e-SBI Statistically significant reduction on frequency of drinking at 6 months. Statistically significant reduction of total consumption at 6 months. Statistically significant reduction of frequency of episodic heavy drinking at 6 months.</p> <p>*Note: No other statistically significant result was found on measures at both 6 months and 12 months.</p>	<p>Unclear</p>	<p>Single-dose e-SBI 6 month outcomes: Frequency of drinking: 21% ↓ Total consumption: 23% ↓</p> <p>12 month outcomes: Total consumption: 23% ↓ AUDIT scores were 2 pt lower</p> <p>Multi-dose e-SBI 6 month outcomes: Frequency of drinking: 15% ↓</p> <p>Total consumption: 21% ↓ Reduced episodic heavy drinking: 35% ↓ AUDIT scores were 2 pt lower</p> <p>12 month outcomes: AUDIT scores were 2 pt lower</p>	<p>Medium to High</p> <p>*Note: No additional benefit to multi versus single dose.</p>

	PRIMARY OUTCOME MEASURE TOOLS	STATISTICAL SIGNIFICANCE	EFFECT SIZE	RATE OF IMPROVEMENT	CLINICAL SIGNIFICANCE
STUDY AND TITLE					
Kypri et al. (2009) Randomised controlled trial of proactive web-based alcohol screening brief intervention for university students	AUDIT (Alcohol Use Disorders Identification Test) Frequency of drinking (number of drinking days in last 2 weeks) Typical occasion quantity (number of drinks per typical drinking occasion in last 4 weeks) Volume consumed (Number of drinks per week)	Alcohol Abuse: Statistically significant benefit of intervention (10-minute web-based motivational assessment and personalised feedback) relative to control (screening).	Unclear	Intervention 1 month Frequency of drinking: 11% ↓ Volume of alcohol per occasion: 7% ↓ Less alcohol overall: 17% ↓ 6 months Frequency of drinking: 9% ↓ Less alcohol overall: 11% ↓	Medium

	PRIMARY OUTCOME MEASURE TOOLS	STATISTICAL SIGNIFICANCE	EFFECT SIZE	RATE OF IMPROVEMENT	CLINICAL SIGNIFICANCE
STUDY AND TITLE					
<p>Mackinnon et al. (2008) Comparative randomised trial of online cognitive-behavioural therapy and an information website for depression: 12-month outcomes</p>	<p>Centre for Epidemiologic Studies Depression (CES-D) Scale (range 0 to 60)</p>	<p>Depression: Yes</p> <p>Intervention Group 1: MoodGYM Statistically significant effect of MoodGYM intervention on reducing depression symptoms, relative to control at post-test. At 6 months, the benefits of MoodGYM intervention, compared to the control, remained statistically significant. At 12 months, the benefits of MoodGYM intervention, compared to the control, remained statistically significant.</p> <p>Intervention Group 2: BluePages Statistically significant effect of BluePages intervention on reducing depression symptoms, relative to control at post-test. At 6 months, the benefits of BluePages intervention, compared to the control DID NOT remain statistically significant. At 12 months, the benefits of BluePages intervention, compared to the control was statistically significant.</p>	<p>Intervention Group 1: MoodGYM Post-test = 0.38 6 months = 0.27 12 months = 0.27</p> <p>Intervention Group 2: BluePages Post-test = 0.29 6 months = 0.21 12 months = 0.29</p>	<p>MoodGYM at 12 months: 35% ↓ (7.7 pt ↓)</p> <p>BluePages at 12 months: 40% ↓ (8.5 pt ↓)</p> <p>Control at 12 months: 24% ↓ (5 pt ↓)</p> <p>*Note: Significant interaction of group by time.</p>	<p>High</p>
<p>Migliorini et al. (2011) Developing and piloting ePACT: A flexible psychological treatment for depression in people living with chronic spinal cord injury</p>	<p>Depression Anxiety and Stress Scale – Short Version (DASS-21)</p>	<p>Depression: No</p> <p>*Note: Due to small sample size, statistical significant effects could not be calculated despite reduction in depression and anxiety symptoms being observed in participants (N = 3).</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>

	PRIMARY OUTCOME MEASURE TOOLS	STATISTICAL SIGNIFICANCE	EFFECT SIZE	RATE OF IMPROVEMENT	CLINICAL SIGNIFICANCE
STUDY AND TITLE					
Moritz et al. (2012) A randomised controlled trial of internet-based therapy in depression	Beck Depression Inventory (BDI)	Depression: Yes Statistically significant reduction of depression symptoms in the intervention group relative to the control group.	Cohen's D = .36 (moderate effect)	Intervention: Deprexis 29% ↓ in depression symptom severity (8.3 pt decrease) Control: Wait-list 15% ↓ in depression symptom severity (4 pt decrease)	Medium to High
Murray et al. (2012) Widening access to treatment of alcohol misuse: Description and formative evaluation of an innovative web-based service in one primary care trust	Past-week Alcohol Consumption (TOT-AL) Alcohol Use Disorders Identification Test (AUDIT) Leeds Dependence Questionnaire (LDQ)	Alcohol Abuse: Yes (on some measures) Statistically significant reduction in consumption.	Unclear	Intervention: The mean reduction in the past week alcohol consumption among the 7 individuals was 35 units Mean AUDIT score reduced 23 to 29 (17% ↓) LDQ (20% ↓)	Medium

	PRIMARY OUTCOME MEASURE TOOLS	STATISTICAL SIGNIFICANCE	EFFECT SIZE	RATE OF IMPROVEMENT	CLINICAL SIGNIFICANCE
STUDY AND TITLE					
Purves et al. (2009) An opening trial in the NHS of Blues Begone: A new home based computerised CBT program	Beck Depression Inventory – II (BDI-II) Beck Anxiety Inventory (BAI)	Depression: Yes Statistically significant reduction in depression symptoms observed in participants. Anxiety: Yes Statistically significant reduction in anxiety symptoms observed in participants.	BDI-II = 1.69 (CI = 13.4 – 19.0) BAI = 1.0 (CI = 7.1 – 11.8)	Intervention: Depression 59% ↓ in point score symptom severity (mean difference = 16.2, 95 th CI: 13.4 – 19) Anxiety 51% ↓ in point score symptom severity (mean difference = 9.4, 95 th CI: 7.1 – 11.8)	High

STUDY AND TITLE	PRIMARY OUTCOME MEASURE TOOLS	STATISTICAL SIGNIFICANCE	EFFECT SIZE	RATE OF IMPROVEMENT	CLINICAL SIGNIFICANCE
<p>Ruehlman et al. (2012) A randomised controlled evaluation of an online chronic pain self-management program</p>	<p>Pain Knowledge</p> <p>Profile of Chronic Pain: Screen (PCP-S) and Profile of Chronic Pain Extended Assessment (PCP-EA)</p> <p>Centre for Epidemiologic Studies Depression (CES-D)</p> <p>Depression Anxiety Stress Scale (DASS)</p>	<p>Pain: Yes Statistically significant reduction for treatment group compared to control group for pain magnitude interference and severity. *Note: Statistically significant effect of intervention on depression and anxiety also.</p> <p>Depression: Yes Statistically significant reduction for treatment group compared to control group for depression symptoms.</p> <p>Anxiety: Yes Statistically significant reduction for treatment group compared to control group for anxiety symptoms</p> <p>Stress: Yes Statistically significant reduction for treatment group compared to control group for stress symptoms</p>	<p>Interference = 0.30</p> <p>Severity = 0.20</p>	<p>Pain Interference 1.6 pt greater ↓ in pain interference (15% ↓ for intervention, 4% ↓ for control)</p> <p>Severity 0.64 pt greater ↓ in severity (8% ↓ for intervention, 6% ↓ for control)</p> <p>Emotional Burden 0.79 pt greater ↓ in emotional burden (22% ↓ for intervention, 6% ↓ for control)</p> <p>Disability 0.66 pt greater ↓ in disability (19% ↓ for intervention, 8% ↓ for control)</p> <p>CES-D Depression 1.6 pt ↓ in symptom severity (14% ↓ for intervention, 2% ↓ for control)</p>	<p>Medium</p>

	PRIMARY OUTCOME MEASURE TOOLS	STATISTICAL SIGNIFICANCE	EFFECT SIZE	RATE OF IMPROVEMENT	CLINICAL SIGNIFICANCE
STUDY AND TITLE					
				<p>DASS Depression 0.7 pt ↓ in symptom severity (12% ↓ for intervention, 4% ↓ for control)</p> <p>Anxiety 0.5 pt ↓ in symptom severity (16% ↓ for intervention, 4% ↑ for control)</p> <p>Stress 0.9 pt ↓ in symptom severity (17% ↓ for intervention, 3% ↓ for control)</p>	
<p>Scholes et al. (2007) A randomised controlled trial to assess the effectiveness of providing self-help information to people with symptoms of acute stress disorder following a traumatic injury</p>	<p>Acute Stress Disorder Scale (ASDS)</p> <p>Post-traumatic Diagnostic Scale (PDS)</p>	<p>Acute Stress Disorder (ASD) and Post-traumatic Stress Disorder (PTSD): No</p>	N/A	N/A	N/A
<p>Spek et al. (2007) Internet-based cognitive behavioural therapy for sub-threshold depression in people over 50 years old: A randomised controlled clinical trial</p>	<p>Edinburgh Depression Scale (EDS)</p> <p>Beck Depression Inventory – II (BDI-II)</p> <p>World Health Organisation Composite International Diagnostic Interview (WHO CIDI)</p>	<p>Depression: Yes Statistically significant effect of intervention relative to wait-list control group on reducing depression symptoms.</p>	<p>Control: 0.45</p> <p>Intervention: 1.0</p>	<p>Intervention BDI-II 38% ↓ in symptom severity (7.2 pt ↓)</p> <p>Control BDI-II 20% ↓ in symptom severity (4 pt ↓)</p>	High

	PRIMARY OUTCOME MEASURE TOOLS	STATISTICAL SIGNIFICANCE	EFFECT SIZE	RATE OF IMPROVEMENT	CLINICAL SIGNIFICANCE
STUDY AND TITLE					
Spek et al. (2008) One-year follow-up results of a randomised controlled clinical trial on internet-based cognitive behavioural therapy for sub-threshold depression in people over 50 years	Edinburgh Depression Scale (EDS) Beck Depression Inventory – II (BDI-II) World Health Organisation Composite International Diagnostic Interview (WHO CIDI)	Depression: Yes Statistically significant effect of intervention relative to wait-list control group on reducing depression symptoms.	Control: 0.69 Intervention: 0.62	Intervention BDI-II 45% ↓ in symptom severity (8.6 pt ↓) Control BDI-II 30% ↓ in symptom severity (5 pt ↓)	High
Turpin et al. (2005) Effectiveness of providing self-help information following acute traumatic injury: Randomised controlled trial	Post-traumatic Diagnostic Scale (PDS) Hospital Anxiety and Depression Scale (HADS)	Post-traumatic Stress Disorder (PTSD): No Depression: No Anxiety: No	N/A	N/A	N/A

	PRIMARY OUTCOME MEASURE TOOLS	STATISTICAL SIGNIFICANCE	EFFECT SIZE	RATE OF IMPROVEMENT	CLINICAL SIGNIFICANCE
STUDY AND TITLE					
Zautra et al. (2012) Phone-based interventions with automated mindfulness and mastery messages improve the daily functioning for depressed middle-aged community residents	10-item Positive Affect 10-item Negative Affect 3-item Daily Depression Scale 3 items from SF-36 Role-emotional Subscale	<p align="center">Depression: Yes</p> <p>Intervention Group 1: Personal control/mastery (MC) Statistically significant effect of intervention compared to control in reducing depression symptoms.</p> <p>Intervention Group 2: Mindful awareness/acceptance (MA) Statistically significant effect of intervention compared to control in reducing depression symptoms.</p>	Unclear/Not Reported	<p>MC had lower levels of depression, lower levels negative affect and increasing SF-36 role-emotion over time</p> <p>MA effects as above but changes in depression and negative affect are significantly larger in MC, and marginally larger than MA compared to control.</p> <p>Improvements in positive affect are greater in MA compared to controls, marginal benefit of MC.</p> <p>SF-36 role-emotion did not differ between groups.</p>	% change cannot be determined, therefore clinical significance unknown.

*Note: Studies highlighted in green reported demonstrated statistical significant effectiveness relative to the main outcome measure(s) of interest.

2.3.3 QUALITY ASSESSMENT AND OVERALL EFFECTIVENESS SUMMARY

Table 5 summarises the quality assessment and overall effectiveness evaluation across the 27 included studies. Of these studies, 21 presented evidence at Level II, which is equivalent to randomised controlled trials (RCTs). The bias assessment of each study indicated that as a whole set of studies, the presence of bias was low. This indicates that there was good internal validity. In terms of external validity, a variation of minor, moderate and severe issues were observed across the different studies. Overall, 18 studies demonstrated treatment effectiveness, with the majority also being deemed highly feasible. Given the majority of remote delivered interventions are often highly feasible due to their characteristics, cost effectiveness was determined relative to the interventions' overall statistical and clinical significance.

Table 5 Quality Assessment and Overall Effectiveness Evaluation Summary

	LEVEL OF EVIDENCE	BIAS					EXTERNAL VALIDITY	OVERALL EFFECTIVENESS	
		SB	PB	AB	DB	RB		TREATMENT EFFECTIVENESS	COST EFFECTIVENESS
STUDY AND TITLE									
Berman et al. (2009) The effectiveness of an online mind-body intervention for older adults with chronic pain	Level II	-	-	-	-	+	N/A Treatment was not effective in this study.	No Effect Treatment was not effective in this study.	N/A Treatment was not effective in this study.
Bugg et al. (2009) A randomised controlled trial of the effectiveness of writing as a self-help intervention for traumatic injury patients at risk of developing post-traumatic stress disorder	Level II	-	-	-	-	-	N/A Treatment was not effective in this study.	No Effect Treatment was not effective in this study.	N/A Treatment was not effective in this study.
Christensen et al. (2002) Web-based cognitive behaviour therapy: Analysis of site usage and changes in depression and anxiety	Level IV	N/A	N/A	N/A	N/A	+	Minor Issues	High	Medium to High
Christensen et al. (2004) Delivering interventions for depression by using the internet: Randomised controlled trial	Level II	-	-	-	-	-	Moderate Issues	Medium	Medium to High
Christensen et al. (2004) A comparison of changes in anxiety and depression symptoms of spontaneous users and trial participants of a cognitive behaviour therapy website	Level IV	N/A	N/A	N/A	N/A	+	N/A Treatment was not effective in this study.	No Effect Treatment was not effective in this study.	N/A Treatment was not effective in this study.
Christensen et al. (2006) Online randomised controlled trial of brief and full cognitive behaviour therapy for depression	Level II	+	-	+	-	+	Minor to Moderate Issues	High	Medium to High

	LEVEL OF EVIDENCE	BIAS					EXTERNAL VALIDITY	OVERALL EFFECTIVENESS	
		SB	PB	AB	DB	RB		TREATMENT EFFECTIVENESS	COST EFFECTIVENESS
STUDY AND TITLE									
Clarke et al. (2002) Overcoming depression on the internet (ODIN): A randomised controlled trial of an internet depression skills intervention program	Level II	-	+	?	-	+	N/A Treatment was not effective in this study.	No Effect Treatment was not effective in this study.	N/A Treatment was not effective in this study.
Clarke et al. (2005) Overcoming depression on the internet (ODIN) (2): A randomised trial of a self-help depression skills program with reminders	Level II	-	+	?	+	-	Moderate to Severe Issues	High	Medium to High
Clarke et al. (2009) Randomised effectiveness trial of an internet, pure self-help, cognitive behavioural intervention for depressive symptoms in young adults	Level II	-	-	-	+	-	Moderate to Severe Issues	Medium	Medium to High
de Graaf et al. (2009) Clinical effectiveness of online computerised cognitive-behavioural therapy without support for depression in primary care: randomised trial	Level II	-	+	-	-	-	N/A Treatment was not effective in this study.	No Effect Treatment was not effective in this study.	N/A Treatment was not effective in this study.
de Graaf et al. (2011) One-year follow-up results of unsupported online computerised cognitive behavioural therapy for depression in primary care: A randomised trial	Level II	-	+	-	-	-	N/A Treatment was not effective in this study.	No Effect Treatment was not effective in this study.	N/A Treatment was not effective in this study.
Holmes et al. (2009) Can playing the computer game "tetris" reduce the build-up of flashbacks for trauma? A proposal from cognitive science	Level II	-	-	-	+	+	Severe Issues	High	High

STUDY AND TITLE	LEVEL OF EVIDENCE	BIAS					EXTERNAL VALIDITY	OVERALL EFFECTIVENESS	
		SB	PB	AB	DB	RB		TREATMENT EFFECTIVENESS	COST EFFECTIVENESS
Kenardy et al. (2008) Information-provision intervention for children and their parents following paediatric accidental injury	Level III-2	+	-	-	+	+	Moderate Issues	High	High
Kypri et al. (2004) Web-based screening and brief intervention for hazardous drinking: A double-blind randomised controlled trial	Level II	-	?	-	?	-	Moderate Issues	High	Medium to High
Kypri et al. (2008) Randomised controlled trial of web-based alcohol screening and brief intervention in primary care	Level II	-	-	-	?	-	Moderate Issues	Medium to High	Medium to High
Kypri et al. (2009) Randomised controlled trial of proactive web-based alcohol screening brief intervention for university students	Level II	-	?	?	?	-	Moderate Issues	Medium	Medium to High
Mackinnon et al. (2008) Comparative randomised trial of online cognitive-behavioural therapy and an information website for depression: 12-month outcomes	Level II	-	?	?	-	-	Moderate to Severe Issues	High	Medium to High
Migliorini et al. (2011) Developing and piloting ePACT: A flexible psychological treatment for depression in people living with chronic spinal cord injury	Level IV	N/A	N/A	N/A	N/A	?	N/A Treatment was not effective for this study.	No Effect Treatment was not effective for this study.	N/A Treatment was not effective for this study.
Moritz et al. (2012) A randomised controlled trial of internet-based therapy in depression	Level II	?	-	-	-	-	Severe Issues	Medium to High	Medium to High

STUDY AND TITLE	LEVEL OF EVIDENCE	BIAS					EXTERNAL VALIDITY	OVERALL EFFECTIVENESS	
		SB	PB	AB	DB	RB		TREATMENT EFFECTIVENESS	COST EFFECTIVENESS
Murray et al. (2012) Widening access to treatment of alcohol misuse: Description and formative evaluation of an innovative web-based service in one primary care trust	Level IV	N/A	N/A	+	N/A	?	Minor Issues	Medium	Medium
Purves et al. (2009) An opening trial in the NHS of Blues Begone: A new home based computerised CBT program	Level IV	N/A	N/A	-	N/A	?	Moderate Issues	High	High
Ruehlman et al. (2012) A randomised controlled evaluation of an online chronic pain self-management program	Level II	?	-	-	-	-	Moderate to Severe Issues	Medium	Medium
Scholes et al. (2007) A randomised controlled trial to assess the effectiveness of providing self-help information to people with symptoms of acute stress disorder following a traumatic injury	Level II	-	+	?	-	-	N/A Treatment was not effective for this study.	No Effect Treatment was not effective for this study.	N/A Treatment was not effective for this study.
Spek et al. (2007) Internet-based cognitive behavioural therapy for sub-threshold depression in people over 50 years old: A randomised controlled clinical trial	Level II	-	-	?	-	?	Minor to Moderate Issues	High	High
Spek et al. (2008) One-year follow-up results of a randomised controlled clinical trial on internet-based cognitive behavioural therapy for sub-threshold depression in people over 50 years	Level II	-	-	-	-	?	Minor to Moderate Issues	High	High

STUDY AND TITLE	LEVEL OF EVIDENCE	BIAS					EXTERNAL VALIDITY	OVERALL EFFECTIVENESS	
		SB	PB	AB	DB	RB		TREATMENT EFFECTIVENESS	COST EFFECTIVENESS
Turpin et al. (2005) Effectiveness of providing self-help information following acute traumatic injury: Randomised controlled trial	Level II	-	-	?	-	-	N/A Treatment was not effective in this study.	NO Treatment was not effective in this study.	N/A Treatment was not effective in this study.
Zautra et al. (2012) Phone-based interventions with automated mindfulness and mastery messages improve the daily functioning for depressed middle-aged community residents	Level II	?	-	?	-	-	Minor Issues	Cannot Determine *Clinical significance unknown.	Cannot Determine *Clinical significance unknown.

*Notes: SB = Selection bias, PB = Performance bias, AB = Attrition bias, DB = Detection bias and RB = Reporting bias.

+ = bias present, - = bias absent and ? = unclear

Studies highlighted in green reported demonstrated statistical significant effectiveness relative to the main outcome measure(s) of interest.

2.4 DISCUSSION

The present systematic review set out to address the research question “***are non-clinician delivered remote mental health services effective in the treatment of mental health conditions experienced post-road trauma injury, relative to no treatment, or treatment as usual?***” Based on the overall findings from the systematic review, there was evidence to support treatment and cost-effectiveness of utilising non-clinician delivered remote mental health interventions for the treatment of a range of conditions, likely to present post-road injury. This section will provide a discussion surrounding the outcomes of the review.

2.4.1 QUALITY OF THE STUDIES

Overall, the majority of included studies were rated as Level II evidence, which is equivalent to randomised control trials (RCTs). This type of study design offers greater control over extraneous variables, therefore increasing the likelihood that high internal consistency (i.e. reduced biases) is observed in the studies. The bias assessment completed across all 27 studies supported this notion. Whilst internal consistency is important in detecting a valid treatment effect, the ability for the results to be generalised in real world settings depends on the level of external validity. Often this can be compromised by strong internal consistency because such control exerted is likely to eliminate variation in a range of participant variables as observed in the general population. The results of the current assessment supported this notion also, with the collection of studies demonstrating external validity issues ranging from mild to severe. It is therefore important that all the outcomes from this review be interpreted with this consideration in mind.

The assessment of included studies led to a number of consistent themes that had the potential to impact on study quality, as well as wider implementation considerations. Of these themes, two significant ones that prevailed were compliance and attrition rates. The interventions predominantly relied on participants to be self-motivated and complete the intervention at their own discretion. This led to a range of issues including high attrition rates and challenges associated with analysing the data collected in such studies. Often “intention-to-treat” analyses was utilised to capture the natural effect of attrition and non-compliance, however imputed values used in the analyses may jeopardise the results identified. From an implementation perspective, these issues also need to be considered. Often the treatment effect can be under-detected due to non-completion or early drop-out rates. In some studies, incentives were utilised to encourage compliance and reduce attrition. This will need to be considered in real-world applications of effective remote interventions, with consideration of contextual issues such as treatment condition and population characteristics.

2.4.2 OVERVIEW OF GENERAL FINDINGS

The search strategy employed yielded a representative sample of studies relevant to the research question specified. The included studies covered all four modes of delivery, the majority of treatment conditions specified (with the exception of travel phobia and substance abuse, although substance abuse was a comorbid condition identified in at least one of the studies). As previously discussed, the search was expanded to include a non-injured population, provided that these studies met all other criteria. Of the included studies, a total of six had a relevant injured population, which included motor vehicle, occupational, assault, falls or sporting injuries. This finding demonstrates an initial gap in the research that is specific to remote mental health treatments designed for post-road trauma individuals. The population covered across the studies was well represented, including participants ranging from children and adolescents, to adults and older adults. In sum, the search provided a diverse range of studies that were able to meet the criteria of the research question, whilst providing a representative sample of the variables of interest.

2.4.3 REMOTE MODES OF INTERVENTION DELIVERY

The search demonstrated that the most commonly examined remote delivery mode for non-clinician based interventions was in the form of internet or online, web-based delivery. The advantages associated with this form of remote delivery include lower costs associated with access, the greater reach achieved, the ability to access the intervention at any point in time desired by the individual, as well as the opportunity to provide scope, alter or

modify the intervention from a provider's perspective. However, internet or online-delivered interventions are not without its limitations. Although the technological advances of the internet have been around for a number of years, this does not preclude that there is an existing older generation that may be either computer illiterate, or experience a preference for intervention tools that are not delivered by a computer. Despite this being a valid consideration, it appears that the natural progression of technological advances and societal influences deem the internet to be a valuable resource or delivery mode for current and future mental health interventions.

Paper-based interventions were examined in a total of four studies of which one (Kenardy et al., 2008) was found to be effective for the treatment of Acute Stress Disorder (ASD) and Post-traumatic Stress Disorder (PTSD). In considering this result, it is likely that paper-based interventions alone, offer limited benefits in the form of reducing symptoms across the selected mental health conditions.

With respect to the other two delivery modes, there was only one identified study for a CD/Computer-based intervention and one for a phone-based intervention. This result makes it difficult to draw conclusive interpretations of effectiveness, despite both studies demonstrating a significant treatment effect for targeted conditions. It does however, not exclude these modes of delivery for further exploration and development.

In summary, when considering the effects identified across the different delivery modes, it can be concluded that the internet or online-based interventions demonstrated the highest level of evidence for effectiveness. It may be postulated that utilising this mode to present information and activities can provide an interactive effect for the end-user. Such interaction may in turn foster interest in completing the intervention, offer the ability for the intervention to be adaptive, meeting the needs of the specific individual, and in some cases, even providing the option for social interaction with other users, which would be particularly important to conditions such as depression and anxiety. Although limited support was identified for the other modes of delivery, it is worthwhile to consider these options as an axillary to other forms of psychological treatments. For example, psycho-education and worksheets are important components to cognitive behavioural therapy. Provided alone, it may be insufficient to demonstrate a treatment effect however, used in combination, it provides the client with at-hand information, as well as the ability to practice and reflect upon their thought patterns. Furthermore, it is worthwhile considering the potential of combining delivery modes to provide a remote intervention (e.g. online-based CBT, with downloadable psycho-education information sheets or activity worksheets).

2.4.4 INTERVENTION EFFECTIVENESS

A total of 12 remote mental health interventions were identified as effective across all of the studies. These interventions included:

- **MoodGYM:** Online CBT designed to target **depression** symptoms.
- **BluePages:** Psycho-education website designed to target **depression** symptoms.
- **Overcoming Depression on the Internet (ODIN):** Online CBT, self-help program designed to target **depression** symptoms.
- **Tetris:** Computer-based game designed to target **Acute Stress Disorder (ASD)** symptoms.
- **Trauma Information Booklet:** Paper-based information booklet designed to target **Acute Stress Disorder (ASD)** and **Post-traumatic Stress Disorder (PTSD)** symptoms.
- **Alcohol Screening and Brief Intervention:** Web-based assessment and intervention designed to target **alcohol abuse** symptoms.
- **Deprexis:** Online CBT-based exercises designed to target **depression** symptoms.
- **Down Your Drink (DYD):** Online self-help program with assessment and support, designed to target **alcohol abuse** symptoms.
- **Blues Begone:** Online CBT program designed to target **depression** and **anxiety** symptoms.
- **Chronic Pain Management:** Online program designed to target **pain**, **depression** and **anxiety** symptoms.
- **Internet-based CBT (by Trimbos Institute, The Netherlands, Institute of Mental Health and Addiction):** Online-CBT program designed to target **depression** symptoms.
- **Personal Control/Mastery (MC):** Phone-based intervention targeting **depression** symptoms.

- **Mindful Awareness/Acceptance (MA):** Phone-based intervention targeting **depression** symptoms.

The results from the assessment of the studies indicate that the above interventions all demonstrated a medium to high level of clinical significance (with the exception of Personal Control/Mastery and Mindful Awareness/Acceptance where effectiveness level could not be determined), therefore indicating that these interventions were able to reduce symptom severity within the study population. Based on these findings, non-clinician based remote interventions are likely to be most readily available and effective for treatment of depression symptoms. It is however, important to consider the level of severity of these symptoms. From the identified studies, participants were more likely to experience mild to moderate levels of depression, therefore indicating the effectiveness results are most applicable to this level of symptom presentation. This translated across the other treatment conditions also. This suggests that non-clinician based remote mental health interventions are likely to be most effective for the treatment of mild to moderate symptoms.

It is also important to recognise that whilst the interventions listed may differ, it appears that the underlying foundation that guides the majority of the interventions relates to cognitive behavioral therapy (CBT) principles. This finding is not surprising as CBT has a strong evidence-base for therapeutic effectiveness in a range of treatment conditions (Hoifodt, Strom, Kolstrup, Eisemann, & Waterloo, 2011). It will be important for future studies to identify an effective remote delivery mode that complements this form of intervention, although at present, this research demonstrates that non-clinician, online-based CBT is highly promising. Furthermore, other forms of evidence-based psychological treatments currently delivered face-to-face by a clinician, may also be interesting to consider in terms of potential remote delivery.

2.4.5 LIMITATIONS

Overall, the systematic review revealed promising findings associated with the effectiveness of remote mental health interventions compared to no treatment or treatment as usual. This conclusion needs to be considered in the context of the limitations associated with the overall review. As discussed, the external validity of the studies ranged from mild to severe issues. This suggests that there may be weaknesses in the generalisability of the effectiveness in real world populations. Furthermore, the majority of studies related to a non-injured population, which may influence the extent to which these findings can be applied. However, in the absence of studies having been completed with a post-road trauma injured population, the included studies are likely to provide a reasonable base for inferences to be made.

3.0 NATIONAL AND INTERNATIONAL COMPENSATION SCHEMES

3.1 INTRODUCTION

As part of the Remote Mental Health Interventions review, it has been proposed that a relevant set of other national and international compensation schemes should be assessed for their mental health service delivery across a range of different areas of compensable injury. This assessment will assist with highlighting current practices throughout the world, comparing and contrasting what has been found to be practically effective.

3.1.1 AIMS AND OBJECTIVES

The overall aim of this section is to review national and international compensation schemes for their mental health service delivery. More specifically, the objectives include:

- Compare features, approaches and strategies undertaken by other national and international compensation schemes in delivering services targeted at mental health issues for clients; and
- Identify effective “remote mental health services” utilised by other national and international compensation schemes with consideration of their application within the TAC Recovery claims model.

3.2 METHOD

3.2.1 SURVEY DEVELOPMENT

In order to achieve a systematic assessment of different compensation schemes, variables of interest were established. Table 6 provides an outline of the criteria to be considered, a description of each criterion, as well as the rationale for why it should be considered. Appendix B provides the questionnaire that has been designed to be distributed to selected national and international compensation schemes for assessment of their mental health service delivery approach.

Table 6 Assessment Criteria for the Review of National and International Compensation Schemes

	Criterion	Description	Rationale for Inclusion
1	Mental health service delivery.*	The delivery of services that are targeted at mental health issues of clients involved with a compensation claim.	Focus of review is on services targeting mental health issues.
2	Name of compensation scheme.		
3	Country and state/area compensation is provided.		This is important in identifying any trends or patterns of service delivery that may vary due to location and client demographics.

4	Type of compensation scheme (i.e. type of accident or injury modality considered).	This refers to the situational circumstance by which the client was injured.	This provides important context to presenting issues for clients post accident, as well as helps to inform treatment or support services provided.
5	Mental health problems and related issues that services are provided for.	Types of mental health disorders or symptoms of disorders that services are provided for.	This is important in providing the context for the types of mental health presenting issues that services are directed at within the compensation scheme.
6	Screening clients for mental health related issues.	The process of screening clients for mental health related issues.	Screening of clients is essential because if clients in need cannot be identified, treatment or support services cannot be offered. This is important in providing any insights into potential gaps and options for improved screening procedures.
7	Types of mental health services provided.	Different mental health services with a focus on delivery mode.	This criterion is the main focus of the assessment. It is important to understand the types of services that are offered, as well as the mode of delivery of each service type because this has implications on feasibility, and reach of services.
8	Effectiveness of services.	Effectiveness refers to the services' ability to meet their purpose(s) and produce the intended result(s).	This criterion is also the main focus of the assessment. It is important to not only understand what services are offered, but an understanding of their effectiveness to address the presenting mental health issues is essential.
9	Client monitoring and feedback.	Processes implemented to monitor client progress, as well as enable the provision of feedback from clients.	This criterion is important in the context of measuring effectiveness of services, as well as client experience and satisfaction with the services provided. This information will help gain insights into potential gaps and options for improved processes related to client interaction within the domain of service delivery.

10	Other comments.		This provides respondents with an opportunity to contribute any further information that is not otherwise covered within the questionnaire.
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Note: * indicates qualifying criteria (i.e. compensation schemes that do not meet this criterion will not be considered in the review).

3.2.2 DATA COLLECTION AND PROCEDURE

The National and International Compensation Schemes Survey was built in Qualtrics, an online survey program. Participants were invited to participate via an email invitation. All data collected remained anonymous and the results presented were done so in aggregate form.

3.3 RESULTS

This section presents the aggregate results obtained from the National and International Compensation Schemes survey, designed to identify current practices related to the provision of mental health services to compensation clients worldwide. A total of 29 respondents were recorded (i.e. 29 compensation organisations worldwide). Of these compensation organisations, a total of 23 indicated that their compensation scheme comprised a mental health component. The following results presented, focused on these 23 organisations.

3.3.1 CHARACTERISTICS OF COMPENSATIONS SCHEMES

The first component of the National and International Compensation Schemes survey documented details related to the compensation schemes in terms of the country of origin (see Table 7), type of cover provided (see Table 8) and supported mental health issues (see Table 9). The results demonstrate that compensations schemes included in this survey were from English speaking, western countries. The majority of respondents were from a work place accident compensation scheme. A range of mental health issues were reported to be supported by all the compensation schemes, with the main issues being Anxiety Disorders, Acute Stress Disorder (ASD) / Post-traumatic Stress Disorder (PTSD), Mood Disorders and pain. Of the 23 compensation schemes contributing to the survey results, there were eight respondents who indicated processes were in place for screening clients for mental health issues using a range of specific client screening tools. This suggests that approximately only one-third of compensation schemes involved in the study utilise a means to screen for mental health issues indicating that this is a potential area for further development.

Table 7 Country of Origin for Included Compensation Schemes

Country of Origin	Number of Compensation Schemes
Australia	8
Canada	7
New Zealand	1
United States	5
Not Specified	2

Table 8 Type of Cover Provided by Included Compensation Schemes

Type of Scheme	Number of Compensation Schemes
Traffic / Road Accident	5
Work Place Accident	11
General / All Inclusive	1
Other	1

Table 9 Mental Health Issues Supported by Included Schemes

Mental Health Issue	Number of Compensation Schemes Supporting Mental Health Issue
Mood Disorders	12
Anxiety Disorders	13
Acute Stress Disorder (ASD) / Post-traumatic Stress Disorder (PTSD)	13
Drug or Alcohol Related Disorders	8
Personality Disorders	7
Pain	12
Other	6

3.3.2 TYPE OF MENTAL HEALTH SERVICES PROVIDED

A range of different mental health services were considered in the survey to ascertain both the type of service as well as the delivery mode utilised throughout these compensation schemes. Tables 10, 11 and 12 summarise the number of compensation schemes that offer face-to-face, telephone-based and internet-based services to their clients, respectively. The results indicate that face-to-face services are currently the most frequently provided mental health support across the surveyed compensation schemes. Remote mental health services (i.e. telephone-based or internet / web-based services demonstrated lower numbers but represented in this sample. Also a total of 11 respondents indicated “other mental health services” not specified.

Table 10 Types of Face-to-face Services provided by Included Schemes

Face-to-face Service	Number of Compensation Schemes Providing This Service
Individual therapy with psychologist	12
Group-based therapy with psychologist(s)	13
Alcohol or drug rehabilitation	13
Peer support group	8
Provision of psycho-education material	7
Other	6

Table 11 Types of Telephone-based Services Provided by Included Schemes

Telephone-based Service	Number of Compensation Schemes Providing This Service
Therapy with psychologist	2
Counselling and support	2
Problem specific helpline	1
Provision of psycho-education material	3
Other	6

Table 12 Types of Internet / Web-based Services Provided by Included Schemes

Internet / Web-based Service	Number of Compensation Schemes Providing This Service
Individual therapy with psychologist (via video-conferencing)	2
Group therapy with psychologist (via video-conferencing)	1
Problem specific chat rooms / Discussion forums	0
Psycho-education (via approved websites)	3
Other	10

3.3.3 EFFECTIVENESS OF SERVICES

The survey also asked respondents about how “effectiveness” of provided mental health services was defined in their organisation. Collective themes extracted from the responses included:

- Measured in terms of recovery outcomes;
- Early intervention approach;
- Proactive treatment;
- Client engagement, client outcomes, and client returning to health and work.

Respondents were also asked about what they thought were the most effective mental health services. Collective themes extracted from the responses included:

- Individual treatment by a clinical psychologist;
- It depends on the situation; and
- No data available.

3.4 DISCUSSION

3.4.1 PSYCHOLOGICAL SERVICES AVAILABLE IN WORLDWIDE COMPENSATION SCHEMES

Based on the findings from the National and International Compensation Schemes survey, it appears that traditional forms of face-to-face psychological therapies remain the most prominent mental health interventions provided to compensation clients currently. However, there is indication from the results that remote mental health interventions are beginning to surface in the suite of psychological services available to clients in compensable injury settings, worldwide. Given the early stages of its implementation within compensation schemes, exploration of different avenues in this area is still required, in order to assist with developing a more diverse range of services that can be offered to clients at different stages of their claims process. In addition to this, further evaluations of evidence for its effectiveness in such settings may benefit and assist with future implementation of remote mental health interventions.

Other issues that were identified through this survey include the need for effective screening methods utilised with clients. Screening of clients is paramount in determining appropriately, the needs of clients that come through the claims process. The survey suggests that at present, many compensation schemes worldwide still require further development in their screening process in order to accurately identify client needs, and subsequently pair them with appropriate services.

3.4.2 LIMITATIONS

It is important to note that this survey provides only a small representative sample of compensation schemes worldwide, and therefore the results need to be interpreted with care. It does however highlight some of the strengths and limitations associated with current schemes throughout western countries. Most importantly, it demonstrates that remote mental health interventions are a relatively new area of psychological service delivery and that it is only beginning to be implemented in a compensable injury setting.

4.0 APPLICATION TO THE TAC RECOVERY CLAIMS SCHEME

Based on the findings from the systematic review, it can be concluded that there is sufficient scientific evidence to support the use of non-clinician delivered remote mental health services in the treatment of mental health conditions. The studies assessed within the review generated a representative sample, with studies originating throughout the world, examining all four modes of intervention delivery across all age groups. Given that remote mental health interventions is a relatively new and establishing area of research and practice (as supported by the findings from the National and International Compensation Schemes survey), this review was able to identify some of the key interventions, with demonstrated statistical and clinical effectiveness.

In the context of the TAC, implementation of such interventions requires a careful examination of the client population, as well as associated organisational liabilities. Remote mental health interventions, such as those identified in this review, offer a potential avenue of treatment for those clients experiencing symptoms relevant to the intervention. It is important however to consider the level of severity experienced by the client. From the studies identified and the populations examined, remote mental health interventions would best be implemented for clients experiencing mild to moderate symptoms. For those that experience more severe symptom presentation, it is likely that psychological therapies with a trained clinician will provide greater treatment benefits to the client. However, this does not preclude remote mental health interventions being offered as an adjunct to one-on-one, (often face-to-face) therapy with a psychologist.

Furthermore, it is important to note that remote intervention delivery is not mutually exclusive to clinician delivered services. An interesting future area of research may be to explore clinician-delivered remote mental health interventions. Whilst this form of intervention is likely to cost more than non-clinician based remote interventions, it remains important to evaluate the potential treatment efficacy of such services. At present, there is some literature suggesting that remote, clinician delivered mental health interventions are as effective as face-to-face delivered mental health interventions (Titov et al., 2010). This may in turn provide an avenue for individuals with greater symptom severity. This area however, will need to be further investigated.

Another area of research that is crucial to the context of TAC clients is studies that utilise a post-injury population. This population subset is like to exhibit a unique range of characteristics that present differently to the larger general population in their experience of mental health problems. There is currently very limited literature examining the effectiveness of remote mental health interventions in this specified population. Future studies that are able to examine this area specifically will help yield a clearer understanding of which forms of remote mental health interventions are effective for these particular individuals.

In summary, the results of the remote mental health interventions review suggest that non-clinician based remote mental health interventions can be effective in the treatment of a range of mental health problems associated with post-injury trauma. However, such effectiveness will be dependent upon appropriate consideration and matching of client symptom severity, needs and abilities to that of the established intervention. This approach will also require continued review if implemented, in parallel with the continuing development of scientific evidence to support this new and developing area of psychological treatment known as “remote mental health”.

APPENDIX A: SEARCH STRATEGY TERMS

Injury	Intervention Mode	Intervention Type	Condition			
injury	internet OR online OR web*	support	depression OR anxiety OR travel phobia OR acute stress disorder / ASD OR post-traumatic stress disorder / PTSD OR substance abuse / alcohol abuse OR pain OR mental health			
		OR				
		peer support				
		OR				
		discussion forum / discussion board				
		OR				
		chat				
		OR				
		intervention				
		OR				
		e-couch				
		OR				
		website				
		OR				
workbook / exercises						
OR						
psychoeducation						
OR						
self-help						
injury	CD* OR computer	intervention	depression OR anxiety OR travel phobia OR acute stress disorder / ASD OR post-traumatic stress disorder / PTSD OR substance abuse / alcohol abuse OR pain OR mental health			
		OR				
		workbook / exercises				
		OR				
		psychoeducation				
		OR				
		self-help				
		injury		telephone OR phone*	support	depression OR anxiety OR travel phobia OR acute stress disorder / ASD OR post-traumatic stress disorder / PTSD OR substance abuse / alcohol abuse OR pain OR mental health
					OR	
					peer support	
					OR	
					chat	
					OR	
					intervention	
OR						
psychoeducation						
OR						
self-help						

		depression
		OR
		anxiety
		OR
		travel phobia
		OR
		acute stress disorder / ASD
		OR
		post-traumatic stress disorder / PTSD
		OR
		substance abuse / alcohol abuse
		OR
		pain
		OR
		mental health

injury

pamphlet
OR
brochure
OR
book*

APPENDIX B: NATIONAL AND INTERNATIONAL COMPENSATION SCHEMES SURVEY

Assessment protocol form, delivered through the Qualtrics program for online responses.

This short series of questions is designed to assist us in our research in understanding how different compensation schemes throughout the world manage mental health issues presenting within clients who make claims. One of our primary focuses is on mental health service delivery within compensable settings. This research aims to establish an understanding of best practice evidence-based services available worldwide to inform improvements in service delivery for clients, in the hope of achieving improved client outcomes.

	Criterion	Responses
1	Mental health service delivery component.	<input type="checkbox"/> YES, continue to question 2. <input type="checkbox"/> NO, discontinue. Thanks for your time.
2	Name of compensation scheme.	
3	Country and state/area compensation is provided.	Country of compensation scheme: State (or area) compensation scheme covers:
4	Type of compensation scheme (i.e. type of accident or injury modality considered).	<input type="checkbox"/> Traffic or road accident compensation <input type="checkbox"/> Work place accident compensation <input type="checkbox"/> General/all inclusive accident compensation <input type="checkbox"/> Other (please specify):
5	Mental health problems and related issues that services are provided for. <i>Please indicate as many as appropriate within the services you provide to your clients.</i>	<input type="checkbox"/> Mood Disorder symptoms (e.g. depression) <input type="checkbox"/> Anxiety Disorder symptoms (e.g. generalised anxiety, specific phobias) – excluding ASD and PTSD <input type="checkbox"/> Acute Stress Disorder (ASD) or Post-traumatic Stress Disorder (PTSD) <input type="checkbox"/> Drug or Alcohol Related Disorder symptoms <input type="checkbox"/> Personality Disorder symptoms <input type="checkbox"/> Pain <input type="checkbox"/> Other(s) (please specify):
6	Screening clients for mental health related issues.	At which point(s) in the claims process are clients screened for mental health related issues? Please outline the process (including later point(s) of screening to review). What screening measures or tools are used to assess mental health related issues?
7	Types of mental health services provided.	Face-to-face services: <input type="checkbox"/> Psychological services: Individual therapy with psychologist <input type="checkbox"/> Psychological services: Group-based therapy groups facilitated by

		<p>psychologist(s)</p> <p><input type="checkbox"/> Alcohol or drug rehabilitation programs</p> <p><input type="checkbox"/> Peer support groups</p> <p><input type="checkbox"/> Provision of psycho-education material on mental health issues by a trained professional</p> <p><input type="checkbox"/> Other (please specify):</p> <p>Telephone-based services:</p> <p><input type="checkbox"/> Telephone-based therapy with psychologist</p> <p><input type="checkbox"/> Telephone-based counselling and support</p> <p><input type="checkbox"/> Problem-specific helpline</p> <p><input type="checkbox"/> Provision of psycho-education material on mental health issues by a trained professional</p> <p><input type="checkbox"/> Other (please specify):</p> <p>Internet-based services:</p> <p><input type="checkbox"/> Internet-based individual therapy with psychologist (i.e. via video-conference)</p> <p><input type="checkbox"/> Internet-based group therapy facilitated by psychologist</p> <p><input type="checkbox"/> Problem-specific chat rooms or discussion forums</p> <p><input type="checkbox"/> Psycho-education via approved websites targeting mental health issues</p> <p><input type="checkbox"/> Other (please specify):</p> <p>Are there other mental health services that are provided within your scheme, not outlined in the options above? Please specify:</p> <p>Other comments?</p>				
8	<p>Effectiveness of services.</p>	<p>How do you define “effectiveness” in terms of the mental health services you provide?</p> <p>What factors contribute to “effectiveness” of mental health services?</p> <p>Which service(s) specified above, has/have been found to be most effective; and in the treatment of which mental health issue(s)?</p> <table border="1" data-bbox="496 1496 1417 1765"> <thead> <tr> <th data-bbox="496 1496 943 1547">Service Type</th> <th data-bbox="943 1496 1417 1547">Issue Treated</th> </tr> </thead> <tbody> <tr> <td data-bbox="496 1547 943 1765"> </td> <td data-bbox="943 1547 1417 1765"> </td> </tr> </tbody> </table>	Service Type	Issue Treated		
Service Type	Issue Treated					
9	<p>Client monitoring and feedback.</p>	<p>Is there a process by which clients are monitored in terms of their outcomes following receiving mental health services? Please describe.</p> <p>Is there a process by which clients are able to provide feedback regarding their experiences with the mental health services they receive? Please describe.</p>				

10	Other comments.	Please provide any general comments you have regarding the availability, provision of, and challenges associate with mental health service delivery within a compensable setting.
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Thank you for taking the time to complete this questionnaire. Do you consent to be contacted by one of the researchers on this project for the purpose of clarification of your responses or further discussion regarding your responses? If so please provide the following details:

Named person of contact:

Telephone:

Email:

If you wish to get into contact with anyone regarding this questionnaire, please contact:

5.0 REFERENCES

- Berman, R. L. H., Iris, M. A., Bode, R., & Drengenberg, C. (2009). The Effectiveness of an Online Mind-Body Intervention for Older Adults With Chronic Pain. [Article]. *Journal of Pain*, 10(1), 68-79. doi: 10.1016/j.jpain.2008.07.006
- Bugg, A., Turpin, G., Mason, S., & Scholes, C. (2009). A randomised controlled trial of the effectiveness of writing as a self-help intervention for traumatic injury patients at risk of developing post-traumatic stress disorder. [Article]. *Behaviour Research and Therapy*, 47(1), 6-12. doi: 10.1016/j.brat.2008.10.006
- Christensen, H., Griffiths, K. M., & Jorm, A. F. (2004). Delivering interventions for depression by using the internet: randomised controlled trial. *BMJ*, 328(265-268).
- Christensen, H., Griffiths, K. M., & Korten, A. (2002). Web-based Cognitive Behavior Therapy: Analysis of Site Usage and Changes in Depression and Anxiety Scores. *Journal of Medical Internet Research*, 4(1), e3.
- Christensen, H., Griffiths, K. M., Korten, A. E., Brittliffe, K., & Groves, C. (2004). A Comparison of Changes in Anxiety and Depression Symptoms of Spontaneous Users and Trial Participants of a Cognitive Behavior Therapy Website. *Journal of Medical Internet Research*, 6(4), e46.
- Christensen, H., Griffiths, K. M., Mackinnon, A. J., & Brittliffe, K. (2006). Online randomized controlled trial of brief and full cognitive behaviour therapy for depression. *Psychological Medicine*, 36, 1737-1746. doi: 10.1017/S0033291706008695
- Christensen, H., Leach, L. S., Barney, L., Mackinnon, A. J., & Griffiths, K. M. (2006). The effect of web based depression interventions on self reported help seeking: randomised controlled trial. *BMC Psychiatry*, 6(13). doi: 10.1186/1471-244X-6-13
- Clarke, G., Eubanks, D., Reid, E., Kelleher, C., O'Connor, E., DeBar, L. L., . . . Gullion, C. (2005). Overcoming Depression on the Internet (ODIN) (2): A Randomized Trial of a Self-Help Depression Skills Program With Reminders. *Journal of Medical Internet Research*, 7(2), e16. doi: 10.2196/jmir.7.2.e16
- Clarke, G., Kelleher, C., Hornbrook, M., DeBar, L., Dickerson, J., & Gullion, C. (2009). Randomized Effectiveness Trial of an Internet, Pure Self-Help, Cognitive Behavioral Intervention for Depressive Symptoms in Young Adults. *Cognitive Behaviour Therapy*, 38(4), 222-234. doi: 10.1080/16506070802675353
- Clarke, G., Reid, E., Eubanks, D., O'Connor, E., DeBar, L. L., Kelleher, C., . . . Nunley, S. (2002). Overcoming Depression on the Internet (ODIN): A Randomized Controlled Trial of an Internet Depression Skills Intervention Program. *Journal of Medical Internet Research*, 4(3), e14. doi: 10.2196/jmir.4.3.e14
- de Graaf, L. E., Gerhards, S. A. H., Arntz, A., Riper, H., Metsmakers, J. F. M., Evers, S. M. A. A., . . . Huibers, M. J. H. (2009). Clinical effectiveness of online computerised cognitive-behavioural therapy without support for depression in primary care: randomised trial. *The British Journal of Psychiatry*, 195, 73-80. doi: 10.1192/bjp.bp.108.054429
- de Graaf, L. E., Gerhards, S. A. H., Arntz, A., Riper, H., Metsmakers, J. F. M., Evers, S. M. A. A., . . . Huibers, M. J. H. (2011). One-year follow-up results of unsupported online computerized cognitive behavioural therapy for depression in primary care: A randomized trial. *Journal of Behavior Therapy and Experimental Psychiatry*, 42, 89-95. doi: 10.1016/j.jbtep.2010.07.003
- Driessen, E., & Hollon, S. D. (2011). Cognitive behavioural therapy for mood disorders: Efficacy, moderators and mediators. *Psychiatric Clinics of North America*, 33(3), 537-555.
- Fitzharris, M., Shourie, S., & Collie, A. (2012). Evaluation of the Client Conversational Tool within the Recovery Branch of the Transport Accident Commission. Melbourne, Australia: Monash University, Monash Injury Research Institute & Institute for Safety, Compensation and Recovery Research.
- Froushani, P. S., Schneider, J., & Assareh, N. (2011). Meta-review of the effectiveness of computerised CBT in treating depression. *BMC Psychiatry*, 11(131).
- Health Services Group. (2010). Mental Health Strategy (pp. 18). Australia, Melbourne: Health Services Group.
- Higgins, J. P. T., & Green, S. (Eds.). (2009). *Chochrane Handbook for Systematic Reviews of Interventions Version 5.0.2: The Cochrane Collaboration*.
- Hoifodt, R. S., Strom, C., Kolstrup, N., Eisemann, M., & Waterloo, K. (2011). Effectiveness of cognitive behavioural therapy in primary health care: A review. *Family Practice*, 28, 489-504.
- Holmes, E. A., James, E. L., Coode-Bate, T., & Deeproose, C. (2009). Can Playing the Computer Game "Tetris" Reduce the Build-Up of Flashbacks for Trauma? A Proposal from Cognitive Science. [Article]. *Plos One*, 4(1). doi: e4153
10.1371/journal.pone.0004153

- Kenardy, J., McCafferty, K., & Rosa, V. (2003). Internet-Delivered Indicated Prevention For Anxiety Disorders: A Randomized Controlled Trial. *Behavioural and Cognitive Psychotherapy*, 31(3), 279-289. doi: 10.1017/S1352465803003047
- Kenardy, J., Thompson, K., Brocque, R., & Olsson, K. (2008). Information-provision intervention for children and their parents following pediatric accidental injury. *European child & adolescent psychiatry*, (5), 316-325. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1469-7610.2008.01866.x> doi:10.1007/s00787-007-0673-5
- Kypri, K., Hallett, J., Howat, P., McManus, A., Maycock, B., Bowe, S., & Horton, N. J. (2009). Randomized controlled trial of proactive web-based alcohol screening and brief intervention for university students. *Archives of Internal Medicine*, 169(16), 1508-1514.
- Kypri, K., Langley, J. D., Saunders, J. B., Cashell-Smith, M. L., & Herbison, P. (2008). Randomized Controlled Trial of Web-Based Alcohol Screening and Brief Intervention in Primary Care. *Archives of Internal Medicine*, 168(5), 530-536.
- Kypri, K., Saunders, J. B., Williams, S. M., McGee, R. O., Langley, J. D., Cashell-Smith, M. L., & Gallagher, S. J. (2004). Web-based screening and brief intervention for hazardous drinking: A double-blind randomized controlled trial. *Addiction*, 99(11), 1410-1417.
- Mackinnon, A., Griffiths, K. M., & Christensen, H. (2008). Comparative randomised trial of online cognitive-behavioural therapy and an information website for depression: 12-month outcomes. *The British Journal of Psychiatry*, 192, 130-134. doi: 10.1192/bjp.bp.106.032078
- Migliorini, C., Tonge, B., & Sinclair, A. (2011). Developing and Piloting ePACT: A Flexible Psychological Treatment for Depression in People Living With Chronic Spinal Cord Injury. [Article]. *Behaviour Change*, 28(1), 45-54.
- Moritz, S., Schilling, L., Hauschildt, M., Schröder, J., & Treszl, A. (2012). A randomized controlled trial of internet-based therapy in depression. *Behaviour Research and Therapy*, 50, 513-521.
- Murray, E., Linke, S., Harwood, E., Conroy, S., Stevenson, F., & Godfrey, C. (2012). Widening Access to Treatment for Alcohol Misuse: Description and Formative Evaluation of an Innovative Web-Based Service in One Primary Care Trust. *Alcohol and Alcoholism*, 47(6), 697-701.
- NHMRC. (1999). How to review the evidence: Systematic identification and review of scientific literature: National Health and Medical Research Council.
- Otte, C. (2011). Cognitive behavioral therapy in anxiety disorders: Current state of the evidence. *Dialogues in Clinical Neuroscience*, 13(4), 413-421.
- Purves, D. G., Bennett, M., & Wellman, N. (2009). An Open Trial in the NHS of Blues Begone®: A New Home Based Computerized CBT Program. *Behavioural and Cognitive Psychotherapy*, 37(5), 541-551. doi: 10.1017/S1352465809990282
- Robinson, E., Titov, N., Andrews, G., McIntyre, K., Schwencke, G., & Solley, K. (2010). Internet treatment for generalised anxiety disorder: A randomized controlled trial comparing clinician vs. technician assistance. *PLoS ONE*, 5(6), e10942.
- Ruehlman, L. S., Karoly, P., & Enders, C. (2012). A randomized controlled evaluation of an online chronic pain self management program. *Pain*, 153, 319-330.
- Scholes, C., Turpin, G., & Mason, S. (2007). A randomised controlled trial to assess the effectiveness of providing self-help information to people with symptoms of acute stress disorder following a traumatic injury. [Article]. *Behaviour Research and Therapy*, 45(11), 2527-2536. doi: 10.1016/j.brat.2007.06.009
- Spek, V., Cuijpers, P., Nyklíček, I., Smits, N., Riper, H., Keyzer, J., & Pop, V. (2008). One-year follow-up results of a randomized controlled clinical trial on internet-based cognitive behavioural therapy for subthreshold depression in people over 50 years. *Psychological Medicine*, 38, 635-639. doi: 10.1017/S0033291707002590
- Spek, V., Nyklíček, I., Smits, N., Cuijpers, P., Riper, H., Keyzer, J., & Pop, V. (2007). Internet-based cognitive behavioural therapy for subthreshold depression in people over 50 years old: a randomized controlled clinical trial. *Psychological Medicine*, 37, 1797-1806. doi: 10.1017/S0033291707000542
- Titov, N., Andrews, G., Davies, M., McIntyre, K., Robinson, E., & Solley, K. (2010). Internet treatment for depression: A randomised controlled trial comparing clinician vs. technician assistance. *Plos One*, 5(6), e10939.
- Transport Accident Commission. (2011). *Recovery No Fault and Common Law Analyses Version 1.0*. Australia, Melbourne.

- Turpin, G., Downs, M., & Mason, S. (2005). Effectiveness of providing self-help information following acute traumatic injury: randomised controlled trial. [Clinical Trial
Randomized Controlled Trial
Research Support, Non-U.S. Gov't]. *British Journal of Psychiatry*, 187, 76-82.
- Zautra, A. J., Davis, M. C., Reich, J. W., Sturgeon, J. A., & Arewasikporn, A. (2012). Phone-Based Interventions With Automated Mindfulness and Mastery Messages Improve the Daily Functioning for Depressed Middle-Aged Community Residents. *Journal of Psychotherapy Integration*, 22(3), 206-228.