

**A systematic review of the efficacy of internet-based interventions  
for depression and anxiety disorders:  
The possibilities and limitations for feasibility within South Africa**

Thesis submitted by

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## DECLARATION

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A handwritten signature in black ink, appearing to read 'K.T. Sealy-Fisher', with a stylized flourish at the end.

K.T. Sealy-Fisher

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## ABSTRACT

Technological advances may alleviate the burden on South Africa's mental healthcare system. This study is a systematic review of literature that assesses the efficacy of high quality online interventions for depression and anxiety, and that compares the reviewed studies' characteristics to the South African context to assist in future developments of online interventions for depression and anxiety within South Africa. This was achieved through using a 2010 systematic review of Griffiths, Farrer, and Christensen as point of departure. This research had two aims: to provide an updated systematic review of the literature reporting on the efficacy of internet-based interventions for depression and anxiety disorders; and to evaluate the possibilities and limitations for the feasibility of implementing internet-based interventions for depression and anxiety disorders in the South African context. Databases accessed were PubMed, PsycINFO, and Cochrane Central Register of Controlled Trials. Included studies must: (i) report on one or more internet-based intervention, (ii) target depression or anxiety or both, (iii) report the effect size or provide enough information to calculate it, (iv) report a measure of symptoms outcome, (v) be a Randomised Controlled Trial, (vi) include a control group that received no active intervention, (vii) be published and peer-reviewed, (viii) have been published after January 2010. The search yielded 2999 potential studies of which 20 full texts were reviewed. Of these, 75% (n=15) of the studies report effect sizes above 0.20, and 25% (n=5) of the studies report effect sizes above 0.80. Themes emergent from literature and included studies distinguished effective from non-effective studies included the use of cognitive behavioural therapy, therapist input and reminders to engage with the intervention, and duration of over 6 weeks. Attrition rates did not differ between experimental and control groups. Sample characteristics between the reviewed interventions and South Africa's population were found to be different and is discussed. Unfortunately, 37 potential studies could not be accessed and thus not included, although several attempts were made. The majority of studies had effect sizes equal to that of face-to-face therapeutic interventions. Implications of application in South Africa's context with limited technological familiarity, insufficiency of professionally trained therapists, poor literacy, and high costs of internet data are discussed. It is concluded that with appropriate adaptation, online internet interventions for depression and anxiety would be beneficial to South Africa's people and assist in lowering the country's burden of mental health disorders.

**Keywords:** Online, Intervention, Efficacy, Depression, Anxiety, South Africa.

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## **ACRONYMS AND ABBREVIATIONS**

APA	American Psychiatric Association
CBT	Cognitive Behavioural Therapy
iCBT	Internet-based Cognitive Behavioural Therapy
DSM	Diagnostic and Statistical Manual of Mental Disorders
ESD	Effect Size Difference
GAD	Generalised Anxiety Disorder
HPCSA	Health Professions Council of South Africa
ICD	International Classification of Diseases
ICT	Information and Communications Technology
MADD	Mixed Anxiety and Depressive Disorder
MDE	Major Depressive Episode
NGO	Non-Governmental Organisation
NHI	National Health Insurance
PHC	Primary Health Care
PD	Panic Disorder
PTSD	Posttraumatic Stress Disorder
SADAG	South African Depression and Anxiety Group
WHO	World Health Organization

# CHAPTER 1: INTRODUCTION

## 1.1 CHAPTER OVERVIEW

This chapter serves as an introduction to this research study. The context surrounding this research will be briefly discussed, and is further discussed in Chapters 2, 3, and 4. Developing from the context a problem statement is put forward. This problem statement in turn gave rise to the aims of this research. The methods in which the aims of this research were achieved is then highlighted. Lastly an overview of the following chapters of this thesis is given with a view towards clarification.

## 1.2 CONTEXT AND PROBLEM STATEMENT

In excess both anxiety and depression can have significantly detrimental effects on an individual's cognitive, behavioural and physiological wellbeing (Sue, Sue & Sue, 2013; American Psychiatric Association, 2013). Anxiety and depression are at times appropriate reactions to events (APA, 2013; Cromby, Harper, & Reavey, 2013; Sue et al., 2013). However when we become overwhelmed by anxiety or depression, and this leads to dysfunction, a disorder has developed (APA, 2013). According to the World Health Organization the proportion of the world population living with depression is estimated to be 4.4% (World Health Organization, 2017a). According to the World Health Organization (World Health Organization, 2017b), the proportion of the world population living with anxiety disorders is estimated to be 3.6%. Like depression, anxiety is more common among females than males (4.6% of females worldwide compared to 2.6% of males worldwide) (World Health Organization, 2017b).

Comorbidity, or the presence of anxiety and depression disorders in one person is common (Cromby et al., 2013; Stein & Rauch, 2008). Citing research undertaken in 2001 by Carter, Wittchen, Pfister and Kessler, Cromby et al. (2013) point out that the diagnosis of generalised anxiety disorder is particularly troubling because it overlaps with diagnoses associated with depression by up to 70%.

Whether or not comorbidity is an issue, prolonged periods of sadness and worry cause discord in interpersonal relationships and can therefore be a barrier to gaining or holding on to employment, resulting in limited social mobility (Cromby et al., 2013). According to Tolman et al. (2009), social anxiety is an unrecognised barrier to employment and a factor contributing to individuals remaining dependent on social support that is provided by the state. This is supported by the findings of research undertaken by Himle et al. (2014) which found far higher rates of unemployment among persons living with anxiety than those without.

In research examining the costs of absenteeism from work as a result of depression across eight countries, Evans-Lacko and Knapp (2016) found that South Africa and Brazil lose the highest percentage (0.7%) of their respective gross domestic product (GDP) to absenteeism due to depression. Furthermore, even when people who are depressed still manage to go to work, their productivity is often severely compromised; a phenomenon that Evans-Lacko and Knapp (2016) have termed *presenteeism*. According to South African Depression and Anxiety Group (2014), lowered productivity is likely to be as a result of cognitive impairment that is common during depressive episodes. This cognitive impairment typically takes the form of poor concentration, poor memory, and problem-solving difficulties (SADAG, 2014). Evans-Lacko and Knapp (2016) argue that the economic cost of *presenteeism* is likely to be much higher than the cost incurred by absenteeism; about 4.2% of GDP.

Anxiety and depression disorders if left untreated may have devastating consequences for those suffering from the disorders, and those around them. A Statistics South Africa (2015) report indicates that, of all causes of death in South Africa, 11.1% are attributable to non-natural causes, which includes suicide. The annual suicide rate in South Africa is 17.2 per 100 000, this equates to approximately 8% of all causes of death in South Africa annually. Not only does this substantial loss of life have an emotional impact on the lives of the friends and family left behind but they may be affected economically in addition to their emotional distress.

In order to aid these individuals, mental healthcare services are required. Unfortunately, South Africa's current two-tiered (public/private) healthcare system has been criticised as being inequitable towards the majority of its citizens (Department of Health, Republic of South Africa, 2017; Harris et al., 2011). The resulting insufficient mental healthcare is similar

to many other low to middle income countries reviewed by Arjadi, Nauta, Chowdhary & Bockting (2015). De Kock and Pillay (2017) report that, by 2014, there were 2786 clinical psychologists registered in South Africa and, of these, 1213 (43.5%) were employed in the public health sector. It is remarkable that less than half of the clinical psychologists in South Africa are working in the public healthcare sector because this sector services more than 84% of the population (more than 42 000 000 people).

In addition, in South Africa, the mental healthcare that is provided by the state is also woefully underfunded when taking into account South Africa's healthcare burden (Petersen & Lund, 2011). One consequence of this underfunding has been inadequate training and education of healthcare workers (Joska & Flisher, 2007) and poor quality of care in psychiatric hospital settings (Mkize, 2007; Petersen & Lund, 2011).

As South Africa's mental healthcare system is overburdened it would be prudent to take advantage of technological advances that may alleviate the burden. As with most other disciplines technology has had a profound impact on mental healthcare practice. It appears that, in recent years, a growing number of professional mental healthcare providers recognise the potential of technology to improve service delivery. In South Africa a national survey of registered psychology practitioners it was found that 31.3% of clinical psychologists, 29.8% of counselling psychologists, and 15.9% of registered counsellors indicated that they conduct internet-based consultations (Health Professionals Council of South Africa, 2017a). This shows a natural progression towards the use of the internet to provide psychological services.

The experience of other countries has been that internet-based interventions allow for lower costs in general due to reducing travel costs and in terms of minimising the need for costly face-to-face consultations (Paganinia, Teigelköttera, Buntrockb, & Baumeiste, 2018). It could also be possible for participants to interact with internet interventions (depending of the design) without the online presence of the therapist (Berger, 2017). This could give participants the feeling of continuous support whilst freeing healthcare professionals to aid a larger amount of individuals.

Whatever the potential benefits could be it is vital that internet interventions are effective at treating the disorders they claim to. Just as any other new therapeutic modality would have to prove its efficacy through research the same has been true of internet-based interventions. Internet-based interventions for depression and anxiety have proven to be at least as

efficacious as conventional face-to-face modes of therapeutic intervention. Equal outcomes have been found in studies on panic disorder (Bergström et al., 2010; Carlbring et al., 2012; Kiropoulos et al., 2008), social anxiety disorder (Hedman et al., 2011), and subclinical depression (Spek et al., 2007). Systematic reviews conducted in 2006 (Griffiths & Christensen, 2006) and 2010 (Griffiths et al., 2010) of Randomised Controlled Trials (RCTs) of the efficacy of internet-based interventions for anxiety and depression indicated evidence of efficacy relative to controls.

Problem statements that should guide further research therefore include conduction of systematic reviews that assess the efficacy of internet interventions for depression and anxiety disorders that would add to the growing body of evidence of the efficacy of internet interventions. As well as assessing whether or not internet interventions for depression and anxiety disorder would be appropriate in effective alleviation of South Africa's burden of mental illness.

### 1.3 RESEARCH AIMS

As Griffiths et al. (2010) was published near on nine years ago an update to their systematic review to continue the body of knowledge concerning the efficacy of internet interventions for depression and anxiety is called for. This was the prompt for the first aim of my research; (A) to provide an updated review on the efficacy of internet-based interventions for depression and anxiety disorders.

The second aim of my research is (B) to ascertain the possibilities and limitations for internet interventions (for depression and anxiety disorders) feasibility in the South African context. Using knowledge claimed from this updated systematic review in addition to contextual literature on South Africa it was possible to ascertain the possibilities and limitations that such internet-based interventions would have in South Africa. From these possibilities and limitations a list of factors was formed that is specific to the needs of South Africa. This list of factors is a natural end result of ascertaining the possibilities and limitations for internet interventions (for depression and anxiety disorders) feasibility in the South African context, and could be used to aid development of future internet interventions for depression and/or anxiety interventions.



## 1.4 METHODOLOGY

This research made use of systematic review design and a meta-analysis. A systematic review is an appropriate research design for the first aims of this research as it updates a pre-existing systematic review; Griffiths et al. (2010). A systematic review is a type of literature review that involves systematically collecting and analysing specific characteristics of multiple studies (Gough, Oliver, & Thomas, 2012).

This systematic review was carried out in predefined order, in brief: 1. Emergent from contextual literature the research aims were set. The inclusion criterion for studies to be included were predefined by the systematic review that this research replicates. 2. Data were collected in accordance with the Griffiths et al. (2010) predefined criteria with the added criterion of having to have been published between January 2010 (since Griffith et al. 2010) and January 2016 (up to the commencement of the current study). 3. Inclusion criteria allowed for only high quality studies to be included. Studies that did not meet the inclusion criteria were excluded. 4. Data were analysed thematically through the software programme, NVivo, and homogenously tabulated in accordance with Griffiths et al. (2010). Themes that became salient, in relation to efficacy, through the analysis process were then further analysed statistically to more clearly understand their impact on effect size. 5. Conclusions were drawn from the data in regards to the efficacy of the included studies which answer the first aim (A. to provide an updated review on the efficacy of internet-based interventions for depression and anxiety disorders). From those conclusions a basic list of factors that shows the possibilities and limitations of utilising such internet interventions in South Africa was formulated, which addresses the second aim of this research (B. to ascertain the possibilities and limitations of internet interventions, for depression and anxiety disorders, for feasibility in the South African context). This list of factors would support the development of internet-based interventions for depression and anxiety disorders in South Africa. The methodology of this systematic review is described in detail in Chapter 5.

## 1.5 OVERVIEW OF CHAPTERS TO FOLLOW

A literature review to present the surrounding context of the topic is given in Chapters 2 to 4. Chapter 2 gives an understanding of depression and anxiety disorders, their impact, aetiology

and possible treatments. Chapter 3 is concerned with mental healthcare inequity, specifically in the South African context. Chapter 4 covers the progressive technology in mental healthcare, such as internet-based interventions. This chapter is also largely concerned with the implementation of internet-based interventions in South Africa.

This thesis then moves on to the methodology section in Chapter 5, where the process of conducting this research is detailed at great length. Chapter 6 is an amalgamation of the results drawn from the systematic review and a discussion on them. This was done in order to be able to read the discussion on each result directly. From these results a basic list of factors that shows the possibilities and limitations of feasibility for (depression and anxiety disorder) internet interventions in South Africa.

## 1.6 CHAPTER CONCLUSION

This chapter introduced the research of this thesis. A brief overview of the surrounding context of the topic was given from which the aims of this research are based. Those two aims were then described, and the methodology that was used to address those aims was briefly stated. An overview of what can be expected from the following chapters was given. The next chapter will begin to give context to the topic of anxiety and depression disorders.

## **CHAPTER 2: ANXIETY AND DEPRESSION**

### **2.1 CHAPTER OVERVIEW**

This chapter explores what it means to have depression or anxiety disorders in terms of definition, prevalence, and personal and economic impact. Reasoning behind development of these disorders is also explored, as are typical therapeutic interventions.

### **2.2 ANXIETY AND DEPRESSION**

Anxiety is characterised by worry and feelings of fear and apprehension (Sue et al., 2013). It is a fundamental human emotion and something that we have all experienced and will continue to experience throughout our lives. Anxiety is not necessarily bad for us. It can keep us from ignoring danger and it can be performance enhancing (Sue et al., 2013). It is also a completely normal response to the day-to-day stressors of work and family life (APA, 2013; Cromby et al., 2013; Sue et al., 2013). In most instances people manage stress by facing the situation that is stress-inducing. We attempt to iron out interpersonal conflict, for example, by listening to the other person's point of view. Other strategies to reduce stress include problem solving, exercise, and relaxation techniques such as meditation. For some, however, anxiety can be so overwhelming that it disrupts social or occupational functioning and causes significant distress (APA, 2013; Sue et al., 2013).

Anxiety has cognitive, behavioural, and somatic manifestations (Sue et al., 2013). Cognitive manifestations can range from mild worry to outright panic and a sense of impending doom (Sue et al., 2013). The most frequent behavioural manifestation of anxiety is the avoidance of anxiety-provoking situations (Sue et al., 2013). Somatic manifestations include changes in physiological or biological reactions, such as shallow breathing, dry mouth, cold hands or feet, increased perspiration, muscular tenseness, and sensations of dizziness or faintness (Sue et al., 2013). There are five major groups of anxiety disorders: panic disorder (recurrent or unexpected panic attacks); generalised anxiety disorder (excessive worry over a prolonged period of time); phobias (unrealistic fears of specific objects or situations); obsessive compulsive disorder (recurrent persistent intrusive thoughts and impulses); acute and

posttraumatic stress disorder (re-experiencing a traumatic event through recurrent and intrusive memories and dreams) (APA, 2013); Sue et al., 2013).

Depression is characterised by intense sadness, feelings of futility and worthlessness, excessive tiredness, and withdrawal from others (Sue et al., 2013; Cromby et al., 2013). It is noted by Cromby et al. (2013) that individuals do not always present with the same symptoms, some may even describe their experience in terms of lack – such as a lack of emotion which leaves them feeling numb. However, as with anxiety, we have all felt depressed at some point in our lives. Quite often, one can trace episodes of depression to specific events such as becoming unemployed or the death of a loved one, but this is not always the case. If a depressive episode pervades every aspect of a person's life and hinders their ability to function, if it persists over a long period of time, or if it occurs for no apparent reason then these can be signs of a depressive disorder (Sue et al., 2013). Depressive disorders include major depressive disorders (single or recurrent episodes), dysthymic disorder (continued chronic depressed mood), depressive disorder due to other medical condition, and depressive disorders not otherwise specified (APA, 2013).

Depression has affective, cognitive, behavioural, and somatic manifestations (APA, 2013). Affective manifestations include sadness, unhappiness, apathy, and at times anxiety (Sue et al., 2013). Cognitive manifestations include pessimism, guilt, inability to concentrate, loss of interest, lack of motivation, and suicidal ideation (Sue et al., 2013). Behavioural manifestations of depression include low energy, neglect of personal appearance and hygiene, uncontrollable crying, and psychomotor retardation (Sue et al., 2013). Physiological manifestations of depression can also present differently depending on the individual and can include changes in appetite (increased or decreased), constipation, sleep disturbance, loss of sex drive, and disruption of the menstrual cycle (Sue et al., 2013; Cromby et al., 2013). Depressive disorders are distinguishable from other mood disorders such as bipolar disorder in so far as there is no history of mania (Sue et al., 2013). Prevalence of episodes may also differ between individuals as some may experience only one notable episode of extreme sadness in their lives while others may note numerous periods.

## 2.3 COMORBIDITY

It is often the case that people diagnosed with depression disorders and those diagnosed with anxiety disorders are indistinguishable in terms of symptomology (Stein & Rauch, 2008). Stein and Rauch (2008) argue that people given a diagnosis of generalised anxiety disorder cannot be differentiated reliably from those given a diagnosis of depression. This is because, frequently, depression and anxiety appear to coexist – to varying degrees – in the same person. Andrews, Anderson, Slade and Sunderland (2008) have argued that, if depression and anxiety were distinct diseases then the rates of co-occurrence would be at chance levels, whereas there is a growing body of evidence indicating that rates of co-occurrence are considerably higher than those that would occur by chance. Among youth with depression, for example, estimates of comorbidity with anxiety disorders range from 15% to 75% (Avenevoli, Stolar, Dierker, & Merikangas, 2001; Yorbik, Birmaher, Axelson, Williamson, & Ryan, 2004) and in clinical samples more than half of the patients referred for panic disorder also have a history of major depression (Dunner, 1998).

Three different perspectives emerge in debate on the overlap between depression and anxiety: traditional; comorbid; mixture hypothesis (Stahl, 1993). The traditional perspective is that anxiety and depression are discrete disorders with clearly defined diagnostic guidelines and separate treatments. The comorbid perspective accepts that depression and anxiety can occur at the same time, and the mixture hypothesis proposes that the co-occurrence of anxiety and depression is in fact a completely separate and distinct disorder. The debate on these perspectives is far from settled. For example, while Mixed Anxiety and Depressive Disorder (MADD) is included in the 10<sup>th</sup> revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10), and while it was included in the 4<sup>th</sup> edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), it has been removed in the updated DSM-5.

Whether or not anxiety and depression are distinct disorders it is unsurprising that they should appear together. After all it is reasonable to expect that people who are sad, have a bleak outlook on life, and whose ability to function socially is impaired will also worry about their relationships with others, their jobs, and their ability to cope in general. At the same time it is easy to understand that excessive worry is inconsistent with happiness and that persistent worry is likely to make one feel miserable (Cromby et al., 2013).

Cromby et al. (2013) argue that much of the difficulty in drawing meaningful conclusions about the relationship between anxiety and depression is as a result of reliance on diagnostic categories. Citing research undertaken by Carter et al. in 2001, Cromby et al. (2013) point out that the diagnosis of generalised anxiety disorder is particularly troubling because it overlaps with diagnoses associated with depression by up to 70%. They suggest that single symptom research may be better able to elucidate “the patterns of influence and prevalence that accompany experiences of sadness and worry” (Cromby et al., 2013, p. 200). One example of research in this area is Clark and Watson’s (1991) Tripartite Model of Anxiety and Depression. This model divides the symptoms of depression and anxiety into three groups: general distress (affect), physiological hyperarousal (anxiety), and anhedonia (depression). According to this model both anxiety and depression disorders have high negative affect and low positive affect, but only anxiety has physiological hyperarousal (for example, when one is confronted with an object or situation of which one is fearful), and only depression has anhedonia (the inability to derive pleasure from normally pleasurable activities, e.g. flat affect, numbness) (Clark & Watson, 1991). This model is useful in so far as it helps to make a distinction between anxiety and depression without foreclosing on the possibility of comorbidity.

## 2.4 PERSONAL, SOCIAL, AND ECONOMIC COSTS

Researchers investigating a representative community sample have found that people with major depression perceived a lower subjective quality of life than non-depressed persons – and these differences in perceptions of wellbeing were most evident in relation to perceptions of health and vitality, social relationships and psychological wellbeing (Goldney et al., as cited in Hansson, 2002). In Britain, the results of a national survey of psychiatric morbidity (Meltzer, Gill, Petticrew, & Hinds, 1996) indicate that individuals who have experienced one or more episodes of depression are more likely to be unemployed and living alone. Evidence also suggests that people living with depression have a worse subjective quality of life than people with other psychiatric disorders. Gupta, Kulhara, and Verma (as cited in Hansson, 2002), for example, found that patients with dysthymia have lower life satisfaction than patients with schizophrenia. This observation is supported by a large scale Finnish study (which included both out-patients and in-patients) that found that patients with depression had a lower subjective quality of life than patients with schizophrenia (Koivumaa-Honkanen

et al., as cited in Hansson, 2002). Depression has also been shown to account for greater reductions in perceived quality of life and physical illnesses such as diabetes and arthritis (Wells et al., 1989), lumbalgia, breast cancer or hypertension (Bonicatto, Dew, Zaratiegui, Lorenzo, & Pecina, 2001), and in comparison to haemodialysis patients (Atkinson, Zibin, & Chuan, as cited in Hansson, 2002).

As with depression, individuals living with anxiety report a lower subjective quality of life (Hansson, 2002). A study undertaken by Candilis et al. (as cited in Hansson, 2002) found that persons with Panic Disorder (PD) had considerably lower subjective quality on all physical and mental subscales of the short form health survey (SF-36). It would seem that persons with PD have a low understanding of what it means to be physically and emotionally healthy (Markowitz et al., as cited in Hansson, 2002). If one cannot perceive what is emotionally healthy and what is not, it would be understandably more difficult to maintain a healthy balance of emotions. Such an imbalance could affect a person's day-to-day functioning and therefore quality of life. Individuals with PD are reported to have lower mental health, role functioning, and social functioning in comparison to individuals with major mental illness, except for major depression which had even lower levels (Sherbourne, Verboncoeur, Fifer, Lipschutz, Lubeck, & Bueschin., 1997). This lowering of mental health, role and social functioning is by no means limited to PD. It is a general finding in most anxiety disorders, such as post-traumatic stress disorder (PTSD), obsessive compulsive disorder (OCD), social phobia (SoP), and generalised anxiety disorder (GAD) (Hansson, 2002; Koran Thienemann, & Davenport, 1996; Schneier et al., 1992; Zatzick et al., as cited in Hansson, 2002). In detailing the anxiety disorders Hansson (2002) finds that PD and PTSD have perhaps the lowest subjective quality of life in comparison to the other anxiety disorders he explores.

In comparison, major depression was said to have a lower perceived quality of life than PD (Schonfeld et al., 1997). The perceived quality of life of those with major depression appears to be the lowest in both depression and anxiety groups. In which case, it would make sense for research to have a focus on supporting those with major depression. Furthermore, as depression is associated with diminished social interaction and fulfilling social roles it is unsurprising that people living with depression perceive a lower quality of life than their healthy peers (Hansson, 2002). For example, in a study comparing out-patients with major depression to healthy control subjects it was observed that subjective perceptions regarding quality of life was lower in the out-patient group both at a baseline assessment and at a 6-

month follow-up (Pyne et al., as cited in Hansson, 2002). Differing levels of perceived quality of life between depression and anxiety disorders adds support to the hypothesis that depression and anxiety disorders are separate but can exist in the same individual simultaneously.

With regards to role and social functioning depression disorders can be worsened by inadequate or negative interpersonal relationships (Coyne, Kessler, Tal, Turnbull, Wortman, & Greden, 1987). For example, relationships in which partners are exceptionally critical and are not open to the depressed party confiding in them are said to be indicators of depressive episodes (Coyne et al., 1987). It does not seem to make a difference whether or not the negative interaction is perceived or real, depression places individuals into a more vulnerable mind-set than mentally healthy individuals and that affects their interactions and how they perceive them. This is similar to the effects seen in those with anxiety disorders. Yoon and Zinbarg (2008) conducted a study on emotional facial recognition with participants living with social anxiety and found that they typically evaluated neutral facial expressions as being negative (Yoon & Zinbarg, 2008). Yoon and Zinbarg (2008) argue that this bias (i.e. assuming neutral facial features are in fact expressing negative mood) are likely to cause misunderstandings in communication with others and these misunderstandings can understandably lead to tensions and problems within interpersonal relationships.

As with anxiety, interpersonal relationships are also affected negatively by depression (Coyne et al., 1987). Two studies that assessed the impact of living with a depressed person found that the depression levels of other household members frequently increased to levels higher than that of the general population (Benazon & Coyne, 2000; Coyne et al., 1987). It is believed that this is due to the increased burden of care and responsibility placed upon the other household members of individuals living with depression. While it has been suggested that spending time apart could alleviate the depressive symptoms of these other household members (Benazon & Coyne, 2000) it is unlikely to be beneficial to those living with depression and this is because social support is an important moderating factor both in terms of the severity and the duration of anxiety and depressive episodes (Hallgren, Lundin, Yi, Burström, & Forsell, 2017; Teo, Choi, & Valenstein, 2013).

In addition to impacting interpersonal relationships, anxiety and depression are also correlated with social inequality, although as Cromby et al. (2013) argue, there is no straightforward explanation for this relationship. This is because social inequality is a



struggle for individuals and so that struggle is likely to cause sadness and worry, which may develop to clinically significant levels of anxiety and depression. Equally, prolonged periods of sadness and worry cause discord in interpersonal relationships and can therefore be a barrier to gaining or holding on to employment, resulting in limited social mobility (Cromby et al., 2013).

According to Tolman et al. (2009), social anxiety is an unrecognised barrier to employment and a factor contributing to individuals remaining dependent on social support that is provided by the state. This is supported by the findings of research undertaken by Himle et al. (2014) which found much higher rates of unemployment among persons living with anxiety than those without. In the South African context where large numbers of people are unemployed this means that many individuals who are in fact employable and able to contribute to the economy may be impeded by anxiety. If those levels of anxiety were to be addressed we would have more able bodied individuals contributing to our economy.

According to a report issued by the SADAG (2014) people in management positions in the workplace frequently feel unsupported in terms of providing assistance to employees suffering from depression and this causes additional tension in the work environment, which exacerbates the impact of depression on worker productivity. A mental health report by the World Health Organization (2017a) gives a short list of risks to mental health which may help employers and managers better address areas of concern. These risks include: “inadequate health and safety polices; poor communication and management practices; limited participation in decision making or low control over one’s area of work; low levels of support from employees; inflexible working hours; and unclear tasks or organizational objectives” (World Health Organization, 2017a, p. 1-2). Essentially, being considerate of employees as emotional human beings would help in lessening work related tensions. Interestingly, even if companies did equip managers to provide support to employees living with depression, employees may not be willing to disclose information regarding their mental health. Evans-Lacko and Knapp (2016) observed that while the absentee rate due to depression is high in Japan, that Japanese workers are also less likely to report that they were absent from work as a result of a depressive episode because of fears of being laid off. It appears, therefore, that while depression is having a significant impact on productivity that shifts in workplace cultures and the way in which mental illness is viewed will have to change in order to achieve meaningful gains on this front.

In research examining the costs of absenteeism from work as a result of depression across eight countries, Evans-Lacko and Knapp (2016) found that South Africa and Brazil lose the highest percentage (0.7%) of their respective gross domestic product (GDP) to absenteeism due to depression. Furthermore, even when people who are depressed still manage to go to work their productivity is often severely compromised; a phenomenon that Evans-Lacko and Knapp (2016) have termed *presenteeism*. According to SADAG (2014), lowered productivity is likely to be as a result of cognitive impairment that is common during depressive episodes. This cognitive impairment typically takes the form of poor concentration, poor memory, and problem-solving difficulties (SADAG, 2014). Evans-Lacko and Knapp (2016) argue that the economic cost of *presenteeism* is likely to be much higher than the cost incurred by absenteeism; about 4.2% of GDP.

Finally, the economic costs of anxiety and depression are not only borne in workplace contexts. A Statistics South Africa (2015) report indicates that, of all causes of death in South Africa, 11.1% are attributable to non-natural causes, which includes suicide. The annual suicide rate in South Africa is 17.2 per 100 000, this equates to approximately 8% of all causes of death in South Africa annually. Not only does this substantial loss of life have an emotional impact on the lives of the friends and family left behind but they may be affected economically in addition to their emotional distress. If the lives lost were caregivers or were financially responsible their families then there is a loss of support that would need to be borne by extended family or the state. For all of these reasons it is important that individuals living with anxiety and depression are able to access appropriate psychological support. Depression and anxiety disorders are common in South Africa, but they need not be as detrimental to our individual and social wellbeing as they are currently.

## 2.5 PREVALENCE

According to the World Health Organization the proportion of the world population living with depression is estimated to be 4.4% (World Health Organization, 2017a). There is a difference in the epidemiology of depression which is more common among females (5.1%) than males (3.6%) (World Health Organization, 2018a). In contrast, transgender individuals are believed to have far higher levels of depression and anxiety, although the exact figure is still to be determined and its causes understood (Witcomb et al., 2018). Prevalence rates vary

by region, from a low of 2.6% of the male population in the Western Pacific region to a high of 5.9% of the female population in Africa (World Health Organization, 2018a). Prevalence rates also vary by age and appear to peak in older adulthood (above 7.5% among females aged 55-74 years, and above 5.5% among males) (World Health Organization, 2018a). While depression does also occur in children under 15 years of age it does so at lower rates than the older age groups. The total estimated number of people living with depression increased by 18.4% between 2005 and 2015. This reflects not only the overall growth of the global population but a proportionate increase in the age groups at which depression is more prevalent (World Health Organization, 2017b).

According to the World Health Organization (World Health Organization, 2017b), the proportion of the world population living with anxiety disorders is estimated to be 3.6%. Like depression, anxiety is more common among females than males (4.6% of females worldwide compared to 2.6% of males worldwide) (World Health Organization, 2017b). However, unlike depression, anxiety prevalence rates do not vary substantially between age groups. The total estimated number of people living with anxiety disorders in the world is 264 million. This total represents a 14.9% increase since 2005.

The results of a South African Stress and Health study with a nationally representative sample of participants found that the lifetime prevalence of Major Depressive Episode (MDE) was 9.7%, and 4.9% in the past 12 months (Tomlinson, Grimsrud, Stein, Williams & Myer, 2009). The prevalence of MDE was significantly higher among female respondents who were 1.75 times more likely to experience lifetime depression than males and 2.17 times more likely to experience MDE in the past 12 months. The mean age of onset of MDE was 25.8 years for the total sample, 26 years for females and 25.6 years for males. In line with global trends, the study found that risk for MDE is low until the early adolescence and then begins to rise increasingly steeply. The prevalence of MDE was significantly higher among individuals aged 40 to 49 years (they were 1.71 times more likely to have experienced lifetime MDE than other age groups. Importantly, the prevalence of MDE was significantly higher among individuals with a low level of education; those with Grade 1 – 7 schooling being 2.1 times more likely to have experienced lifetime MDE and 3.7 times more likely to have experienced MDE in the past 12 months than those with higher levels of education.

Various explanations have been put forward for these patterns in the prevalence of anxiety and depression. There is evidence that levels of anxiety fluctuate according to the socio-

environments and availability of material resources (Cromby et al., 2013). A study in the UK (Klerman, 1988, cited in Cromby et al., 2013) found a marked increase in rates of depression among people born in the years following World War II and Cromby et al (2013) argue that this increase cannot be written off as simply being due to better diagnosis and access to psychological services in the UK post WWII because similar increases are observed (e.g. Hagnell, Lanke, Rorsman, & Ojesjo, 1982, cited in Cromby et al., 2013) in other countries similarly affected by the war. Evidence of a relationship between the prevalence of anxiety and depression and contextual factors, such as war, suggests that depression and anxiety are not simply brought about by individual factors but that one's experiences also play a role. Children born shortly after WWII grew up in a context where high levels of worry were common and it is now not controversial to claim that those living with anxiety and depression are also more likely to have experienced more of life's challenges than the general population (Burton, 2006, as cited in Cromby et al., 2013).

The prevalence of worry and sadness are frequently correlated with social inequality, gender, age, immigrant status, ethnicity, family background, unemployment, and marital status and these effects can be interactive. Ethnicity, for example, is only a factor in the incidence and prevalence of anxiety and depression when other characteristics are at play too – such as social inequality. Hence African Americans have higher rates of depression and anxiety when they are also experiencing social inequality (Cromby et al., 2013). Furthermore, high rates of domestic violence might explain the high rates of depression and anxiety among women (Cromby et al., 2013). Oakley-Browne, Joyce, Wells, Bushnell and Hornblow (1995), for example, found that childhood neglect significantly increased the probability of a diagnosis of depression or anxiety in later life.

South Africans are still dealing with the effects of histories of colonialism and apartheid and thus experience higher incidences of factors known to exacerbate or even induce mental disorders, such as poverty and violence (Comas-Diaz & Jacobsen, 1996; Roser & Ortiz-Ospina, 2017; Ser, 2016). In fact, Comas-Diaz and Jacobsen (1996) believe that a second psychological trauma might have occurred within South Africa when the end of apartheid did not meet the expectations that had developed before the 1994 election. Comas-Diaz and Jacobsen (1996) also acknowledge the connection between deprivation, frustration, and violence – which escalated rapidly when, for many, the change in government did not bring about changes to personal circumstances as expected. South Africa continues to experience a

high incidence of poverty and violence when compared to global standards (Roser & Ortiz-Ospina, 2017; Ser, 2016). These two factors whether separate or in unison are believed to heighten incidence or in severe cases induce mental illness (Plagerson, Patel, Harpham, Kielmann, & Mathee, 2011; Scorgie et al., 2017; Stein, 2012).

Mall et al. (2015) report that anxiety and depression were the primary reason individuals in their sample could not perform their work role. This means that a portion of South Africa's employed are at risk, and the loss of production could have a worrying effect on South Africa's already unstable economy (Mall et al., 2015). Williams et al. (2008) reported that incidence of psychological disorder were higher in South Africa than in Nigeria, with high levels of unmet need. Atwoli et al. (2016) notes that, in South Africa, exposure to Potentially Traumatic Events (PTEs) increased the risk of developing a psychological disorder. In another South African study Atwoli, Platt, Williams, Stein, and Koenen (2015) reported that witnessing traumatic events was common place in South Africa and concluded that witnessing traumatic events can result in heightened risk of mood and anxiety disorders.

South Africans experience high levels of human rights violations such as interpersonal violence and neglect in childhood and this significantly increases the risk of developing anxiety and depression disorders (Department of Health, Republic of South Africa, 2013; Kaminer, Grimsrud, Myer, Stein & Williams, 2008; Meffert, McCulloch, Neylan, Gandhi, & Lund, 2015; World Health Organization, 2004). The resulting depression and anxiety disorders can prevent individuals from functioning fully in their personal lives as well as in their working lives (APA, 2013). Levels of severity do vary but for some individuals daily functionality can be largely derailed leaving them unable to work or maintain lasting relationships (APA, 2013).

Depression and anxiety disorders are of such global prevalence that the World Health Organization (WHO) estimates that by 2020 they will be second only to ischemic heart disease as a major disease burden (World Health Organization 2004). In fact, it is estimated that by 2020 one third of global disability will be caused by clinical depression alone. This estimate excludes milder forms of depression and anxiety disorders which, if included, would increase this estimate considerably (World Health Organization, 2004).

As Hunt, Auriemma, and Cashaw (2003) point out due to the nature of self-reporting of depression prevalence can only ever be given as estimation. In order for a case to be recorded

an individual would need to report that they feel depressed. Given the stigma attached to mental illness it is possible that an unknown number of individuals suffering from depression and anxiety do simply not seek out help and therefore are not counted in statistical estimations. In light of this the prevalence given by the National Mental Health Policy Framework and Strategic Plan for 2013 to 2020 could be far higher in reality. The prevalence given for anxiety was 8.1% of South African adults annually, while depression is assumed to have been included in ‘mood disorders’ with a prevalence of 4.9% of South African adults annually (Department Of Health, Republic Of South Africa, 2013). As one can clearly see the prevalence of anxiety is higher than mood disorders. This may be due to under reporting of depression symptoms or perhaps the high rates of crime and violence in South Africa have led to a high prevalence of anxiety disorders.

Under reporting may be exacerbated by a lack of psychological education. If persons do not recognise the symptoms of anxiety and depression within themselves, they are again less likely to report them and therefore less likely to receive needed assistance. The National Mental Health Policy Framework and Strategic Plan for 2013 to 2020 do note that there is a ‘coordinating body’ put in place by the Department of Health to oversee education and awareness of psychological conditions (Department of Health, Republic Of South Africa, 2013, p.15) That body is the National Directorate: Mental Health and Substance Abuse (Department Of Health, Republic Of South Africa, 2013).

It would seem that even though depression and anxiety disorder are of high prevalence in South Africa there is a substantial possibility that this prevalence may be far higher than we are statistically aware.

## 2.6 AETIOLOGY AND THERAPEUTIC INTERVENTIONS

There is no clear-cut consensus about the aetiology of anxiety and depression (Galyamina, Kovalenko, Smagin, & Kudryavtseva, 2017; Durisko, Mulsant, & Andrews, 2015; Weir, 2012). A number of questions come up when one begins researching the aetiology of depression and anxiety. Question such as: Do depression and anxiety share an aetiology? Could there be more than one cause of these disorders? Would the causes be situational or biological? If a cause is situational would the disorder not end when the situation is changed?

Psychology and medical professionals have been at odds in trying to answer such questions concerning the aetiology of these two symptom domains. I note, however, that much of this debate appears to focus on genetic and environmental factors (Coles & Coleman, 2010; Durisko et al., 2015; Galyamina et al., 2017; Weir, 2012; World Health Organization, 2004).

There are numerous studies indicating that individuals become anxious or depressed after, for example, a natural disaster such as a flood or avalanche (Galyamina et al., 2017; Fox & Shonkoff, 2011; Norton, & Abbot, 2017; Sherr et al., 2016; Weir, 2012). In South Africa Fox and Shonkoff (2011) have reported on the effects of violence upon the minds and brains of children. They write that not only is fear and anxiety heightened after exposure to violence but in terms of neurology the development of young brains can be disrupted due to persistent levels of fear, causing long-term if not life-long negative effects (Fox & Shonkoff, 2011). This disruption leads to negative long-term effects on learning behaviour and ability (Fox & Shonkoff, 2011). Sherr, Hensels, Skeen, Tomlinson, Roberts, and Maced (2016) give a South African and Malawian account of violence predicting poor outcomes of education for school going children. Children recorded as being exposed to physical or emotional violence were found to have poor outcomes in areas such as school enrolment, grade progression, and school attendance, all of which affect school performance (Sherr et al., 2016). South Africa can be seen to have a youth crisis in the prevalence of anxiety disorders caused by violence that are inhibiting them from engaging with South Africa's school curriculum. Traumatic events are of course not limited to poverty and violence, as several unknown factors could be having an effect. Another factor that is salient in South Africa is stigma (Gronholm, Henderson, Deb, & Thornicroft 2017; Oexle et al., 2017). Stigmatisation occurs in South Africa in a number of different settings, for example: HIV positive status, HIV orphan, poverty stigma, mental illness stigma, school bullying, and unemployment (Cluver, & Orkin, 2009; Gronholm, Henderson, et al., 2017; Meinck, Cluver, & Boyes, 2015; Oexle et al., 2017).

However, not all people who experience the same event develop an anxiety or depressive disorder (Southwick & Charney, 2012). It would seem that the reason aetiology is so hard to pin down is because not only are there many different environmental events that could trigger depression or anxiety disorders, but, being triggered also depends on the individuals level of mental resilience and genetic predisposition (Southwick & Charney, 2012; Weir, 2012). Mental resilience involves personality characteristics and a pre-existing sense of optimism

that lowers the risk of depression and anxiety (Edward, 2005; Southwick & Charney, 2012). For example, in persons born a few years post WWII mental resilience may be lower than average as they would not have had the opportunity to develop such resistance due to socio and economic deprivation. They would not have the formative years of stability to allow for a pre-exciting sense of optimism. In addition, exposure to adversity and overcoming it are believed to build resilience (Edward, 2005). Genetic predisposition is an instance where one's genetic markers are altered or 'switched on or off' in reaction to events (Southwick & Charney, 2012; Weir, 2012). For example, when people who have markers for depression are faced with a stressful situation they are more likely to become depressed as that genetic marker would 'switch on' by experiencing the event. These genetic markers can be passed down through generations causing descendants to have a genetic predisposition (Weir, 2012).

Regardless of the precise nature of the aetiology, the two main types of treatment for anxiety and depression are pharmacological and psychological counselling. Pharmacological treatments for depression and anxiety include antidepressants, mood stabilisers, and anxiolytics (Cromby et al., 2013). Antidepressants, as the name suggests, are used to treat depression when it becomes severe enough to be considered a disorder (Cromby et al., 2013). Antidepressants are split into three classes, chronologically. The first antidepressant class to emerge was the monoamine oxidase inhibitors (MAOIs), which worked in a similar to stimulates. The second class was that of the tricyclic antidepressants, which were similar to early antipsychotics and resulted in a sedative effect. Progress in research then brought about the third class, the selective serotonin re-uptake inhibitors (SSRIs) which result in lessened psychoactive effects (Cromby et al., 2013). All of the antidepressant classes work on the principle of correcting chemical imbalance within the brain, such as with noradrenaline and serotonin. This is done in order to normalise chemical imbalances, which would assert normal behaviour (Cromby et al., 2013). Undurraga and Baldessarini (2012) completed a review of 30 years' worth of studies that indicate only a moderate efficacy of antidepressants for acute major depression, which was not much higher than the efficacy of the placebo conditions. Cromby et al. (2013) corroborates this in mentioning that it has been shown that antidepressants are only slightly more effective than placebos. In addition, antidepressants can alleviate anxiety disorders as they have a sedative calming effect (Cromby et al., 2013).

Mood stabilisers, a general term for medications such as lithium, are given in cases of extreme disorders such as bipolar disorder (Cromby et al., 2013). Bipolar disorder which used



to be known as ‘manic depression’ entails a pendulum swing of moods from excessively high to excessively low (depressive) moods (Cromby et al., 2013). Anxiolytics, such as benzodiazepines, have a sedative calming effect on the taker that reduces anxiety and induces sleep (Cromby et al., 2013). Cromby et al. (2013) states that they were once heavily overprescribed for two decades until their addictive effect became clear. Currently, benzodiazepines are recommended to be prescribed for short term use only to prevent psychical dependency on the drug.

Apart from addiction inducing medications, Cromby et al. (2013) reports that many people experience taking pharmacological treatments differently. There does not seem to be fixed outcome when taking such treatment as some will return to full functioning while others will find themselves functional but with a range of unwanted feeling such as “grogginess, dopiness, emotional flattening and agitation” (Cromby et al., 2013). Haslam, Brown, Atkinson, and Haslam (2004) conducted a qualitative study on the experiences of persons with depression and anxiety disorders taking medication for their mental health. It was reported that patients were largely non-compliant in taking their medications as prescribed due to the negative side-effects they experienced (Haslam et al., 2004). It would seem that although such medications can be effective their effect of altering the mind is not always without unpleasant side-effect.

In a systematic review comparing the outcomes of pharmacological versus psychological treatments of depression and anxiety Prajapati (2014) found psychological treatments to be as effective as pharmacological treatments, especially when the psychological treatment took the form of Cognitive Behavioural Therapy (CBT). There are also no mind altering side-effects as there are in pharmacological treatment. Psychological treatment for anxiety and depression has been gathering more public acceptance and greater uptake in recent years (Prajapati, 2014) and, among the various psychological treatments, CBT has shown significant efficacy for treating depression and anxiety disorders (Hendriks, Oude Voshaar, Keijsers, Hoogduin, & van Balkom, 2008; Pozzaa, & Dèttoreb, 2017).

CBT was first developed as Cognitive Therapy (CT) by Aaron Beck in the 1960s as a treatment method for depression (Dozois, & Beck, 2011). CT with the inclusion of Behavioural Therapy (BT) has since been further developed into CBT and has been found to be an effective treatment for other conditions such as personality disorders and substance abuse disorders (Dozois, & Beck, 2011).

At the foundation of CBT is the idea that maladaptive cognition (thought and thought patterns) leads to distress and mental disorders (Hofmann, 2012; Westbrook, Kennerley, & Kirk, 2007). Hofmann (2012) asserts that our behaviour is firmly influenced by our thoughts, thoughts that make up our worldview. Every person experiences life in their own unique way through numerous experiences that build how they perceive the world.

Beck's model holds that maladaptive thought patterns become automatic to the extent that the individual does not perceive them or excludes other options when reacting to situations (Hofmann, 2012). It would then follow that if one could restructure such thought patterns from negative and damaging to more positive and productive a relief in distress could be realised, and therefore a relief in mental disorder.

Although psychological therapy is known colloquially as the 'talking cure' changes also occur on a physical level through its use. Porto et al. (2009) conducted a systematic review of studies investigating the effect of CBT on the psychical structure of the brains of patients with clinically diagnosed anxiety disorders. Porto et al. (2009) state that the results of the 10 included studies showed that using CBT on those patients with anxiety did alter neural pathways and glucose metabolism in sections of the brain. A neural pathway is simply the 'path' or direction of movement of electrochemical impulses through the brain or nervous system via one's neurons (Merriam-Webster, 2018; Nugent, 2013). For example, after CBT treatment glucose uptake decreased in the right part of the hippocampus but levels increased in the prefrontal medial region (Porto et al., 2009). This could show a change in activation from the hippocampus to the prefrontal medial region, which would be a change in neural pathway.

For each mental disorder CBT can be adapted to fit the specific details of that disorder, although the core of the therapy of engaging thought patterns remains (Hofmann et al., 2012). For instance, CBT for depression as a disorder would focus on different thought patterns to that of the array of differing anxiety disorders. For example, since anxiety has fear (physiological hyperarousal) at its base focusing on cognitions that maintain that fear would be useful. This would of course not work for depressive disorders as there is a marked lack of fear at its base, but a focus on thought patterns that maintain depression would still be useful. One would believe that an inducing event would be the focus of restricting thoughts but as Hofmann et al. (2012) claims it is most often the case that what initially caused the anxiety or depression is not what maintains its presence, with the exception of post-traumatic stress

disorder (PTSD). In most cases it is a number of seemingly small events that build an anxiety or depressive disorder (Hofmann et al., 2012).

It is also necessary for recipients of CBT and other psychotherapies to be active participants in their therapy (Hofmann, 2012). The facilitator can guide the participant and illuminate new perspectives, but this effort will be for naught if the participant is not open to engaging with these new ideas and perspectives. Psychotherapy involves collaboration between a facilitator who provides guidance and a participant who engages in new, alternative thought patterns. Without the participant's active engagement old maladaptive thought patterns will remain, and will not be replaced with new adaptive ones. In line with this, a participant of CBT needs a degree of willingness to change, without which the facilitator may find themselves 'fighting an uphill battle', attempting to guide the participant without any sign of progress.

Attrition (premature dropout from therapy) in types of CBT such as trauma-focused CBT is common, especially among children (Wamser-Nanney & Steinzor, 2017). Attrition in group CBT was also found to be high in one study, with evidence of movement towards individual therapy (Bjornsson et al., 2011). Fernandez, Salem, Swift, and Ramtahal (2015) give statistics from their meta-analysis stating that 26.2% of participants dropped out during CBT intervention. Fernandez et al. (2012) discovered significant patterns in their review as to what factors were associated with attrition, these are: (I) Diagnosis. Depression had the highest rates of attrition. (II) Delivery format. High rates of attrition were found in e-therapy (Internet-based interventions). (III) Setting. Highest rate found in outpatients compared to inpatients. (IV) Rates of *retention* rose with the number of sessions for those who started the intervention. These associations may prove useful to this review in comparison to the results found here. Fernandez et al. (2012) did not focus on e-therapy alone but attrition across studies that made use of CBT. It is through this meta-analysis that we know that attrition occurs in all specialisations of CBT use, if unequally, not only Internet-based interventions (Fernandez et al., 2012).

No matter which psychological method of treatment is used, the prevalence of people suffering from depression and anxiety in South Africa is high (annual adult population diagnosed is 4.9% mood disorders, and 8.1% anxiety) (Department of Health, Republic Of South Africa, 2013). This needs to be addressed not only to improve the lives of those suffering from these disorders and those closest to them, but for the upliftment of South Africa's economy. Healthcare systems are under a great deal of pressure to deliver solutions

and alleviate this predicament. Perhaps it is time to lighten the load by broadening the scope of treatment to include that which other countries have been making successful use of for years, by which I refer to internet-based interventions. If pressure is not lifted, then the treatment gap will continue to grow.

## 2.7 CHAPTER CONCLUSIONS

This chapter introduced the reader to anxiety and depression disorders, how they can be comorbid, their personal, social and economic impacts. Prevalence was discussed in order to give an idea of the scale impact. This chapter also touched on the origins or aetiology of such disorders and what treatments are available to help alleviate the suffering of depression and anxiety disorders. The following chapter will delve deeper into the surrounding literature to discuss the inequality present in mental healthcare treatment.

## **CHAPTER 3: THE TREATMENT GAP IN MENTAL HEALTHCARE**

### **3.1 CHAPTER OVERVIEW**

Given the high rates of depression and anxiety in South Africa and its devastating impact on individuals and society more broadly (SADAG, 2014), it is essential that our health system is responsive to the needs of people living with anxiety and depression. In this chapter I discuss the healthcare system in South Africa and the challenges inherent in accessing mental healthcare services. Issue that are discussed are access, healthcare inequality, and addressing that inequality.

### **3.2 ACCESSING MENTAL HEALTHCARE SERVICES**

According to a World Health Organization (2017b) report South Africa has 11.95 mental healthcare workers per 100 000 population, which it deems to be acceptable by international standards. However, according to Lund, Kleintjes, Kakuma and Flisher (2010) psychologists and psychiatrists make up less than one percent of this workforce, which also includes: medical doctors, nurses, social workers, occupational therapists, and auxiliary staff such as non-doctor and non-nurse primary healthcare workers.

The Health Professions Council of South Africa (HPCSA) Professional Board for Psychology reports that over 18 750 psychologists were registered with it in 2017 (Health Professions Counsel Of South Africa, 2017a). However, this number includes psychologists in all categories of registration. It includes educational psychologists, industrial psychologists, research psychologists, psychometrists, student, intern and community service clinical psychologists; some of whom are not specifically responsible for the diagnosis and treatment of mental illness – which is the work of counselling, clinical and educational psychologists with a practice number.

De Kock and Pillay (2017) report that, by 2014, there were 2786 clinical psychologists registered in South Africa and, of these, 1213 (43.5%) were employed in the public health

sector. It is remarkable that less than half of the clinical psychologists in South Africa are working in the public healthcare sector because this sector services more than 84% of the population (more than 42 000 000 people). This means that more than half of the clinical psychologists in South Africa (n=1573, 56.5%) are working in the private healthcare sector which services less than 16% of the population (about 8 000 000 people).

South Africa's current two-tiered (public/private) healthcare system has been criticised as being inequitable towards the majority of its citizens (Department of Health, Republic of South Africa, 2017; Harris et al., 2011). This is because the higher quality benefits of the private sector are only available to those who can afford its high costs, usually with the assistance of a medical aid scheme through membership that is bought through monthly contributions to the scheme. Medical aid schemes have been present in South Africa since around 1889 when they emerged as unregulated occupational insurance in South Africa's mining industry. Currently, several such schemes are non-occupational (open) with high consultation and treatment costs that are negotiated between medical aid scheme administrators and private hospitals, but such negotiations are said to be impacted by medical aid members aversion to make use of public healthcare (Coovadia, Jewkes, Barron, Sanders & McIntyre, 2009).

The public healthcare sector in South Africa has been affected by a chronic staffing shortage and maldistribution of staff which has severely compromised the delivery of public sector healthcare services. The staffing crisis has been aggravated by a number of ill-informed policy decisions, such as offering voluntary severance packages to public sector staff in the mid-1990s that had the effect of moving (often skilled) staff out of the public sector and into the private sector, and by foreign recruitment agencies that have sent many South African healthcare professionals to work abroad in better remunerated jobs and better resourced settings (Coovadia et al., 2009).

In South Africa, mental healthcare that is provided by the state is also woefully underfunded when taking into account South Africa's healthcare burden (Petersen & Lund, 2011). One consequence of this underfunding has been inadequate training and education of healthcare workers (Joska & Flisher, 2007) and poor quality of care in psychiatric hospital settings (Mkize, 2007; Petersen & Lund, 2011). Recent research also indicates that there is irregular and inconsistent identification and referral of anxiety and depression at primary healthcare facilities (Herman et al., 2009). Furthermore, even when anxiety and depression is identified

and referred, availability and access to psychological treatment is limited. Unfortunately, even when access to psychological treatment is available and accessible, the stigma associated with psychological illness often means that individuals are unwilling to utilize treatment services (Kazdin & Rabbitt, 2013; Seeman, Tang, Brown, & Ing, 2016; Sue et al., 2013; World Health Organization, 2004).

The private healthcare sector is also not without problems. Membership to medical aid schemes is exorbitantly costly and there are many limitations to treatment provision (such as annual claim ceilings for certain conditions, medicines, or procedures). Discovery Health, for example, limits hospital cover for mental illness (Discovery Health Medical Scheme, 2017). Furthermore, as the services of traditional healers are not covered by medical schemes the costs of these services are paid for out-of-pocket even if the individual has medical aid cover.

For most South Africans, access to mental health services is limited by financial cost. However, there are other challenges too such as cultural relevance, language barriers, and logistics (Nyatsanza, Schneider, Davies, & Lund, 2016; Statistics South Africa, 2016b). Western psychological theory and practice focuses on the individual and assumes an independent self; a separate entity from their communities (Richards, 2002). Thus, even those South Africans who can afford to access psychological services may not be able to access services that are compatible with their worldview, or a therapist who can communicate with them in their own language. In such instances patients are discriminated against due to cultural differences and language barriers which can lead to misunderstandings, misdiagnoses, and delayed or inappropriate care (Ohtani, Suzuki, Takeuchi, & Uchida, 2015).

Furthermore, South African psychological services, whether public or private, are seldom available in rural areas making access even more of a challenge (Loeliger, Niccolai, Mtungwa, Moll, & Shenoi, 2016). Geographical access or the ability to physically reach the place of healthcare is at times unattainable for those for whom transport is a daily issue (Loeliger et al., 2016). Williams et al. (2008) indicates the geographical spread of mental healthcare workers with the majority based in urban areas, especially city mental healthcare hospitals. Rural areas have little to no professional mental healthcare support (Williams et al., 2008). South Africans who live in remote rural locations must travel long distances to reach the basic healthcare provided by the public sector, which might or might not be present upon their arrival (Loeliger et al., 2016). Geographically, the majority of South Africa's registered psychologists work within the provinces of Gauteng and the Western Cape and are largely

city based leaving rural areas without such services (Department of Health, Republic of South Africa, 2013; Health Professions Counsel of South Africa, 2017b; Williams et al., 2008). Access is further limited by South Africa's lack of sufficient psychology practitioners (HPCSA, 2017a). Most of those trained are drawn to the higher income of the private sector. In addition, those who wish to make their way into the public sector are faced with a number of challenges, challenges such as low post availability, low remuneration, concern about maladministration and inadequate mental health policy resulting in under-resourcing (Lund, et al., 2010). This has the effect of adding to the push and pull of movement of practitioners towards the private health sector leading to inequalities in service delivery.

The problems of under resourced healthcare, dearth of mental healthcare professionals, geographical concerns, and other such issues that limit access to quality mental healthcare are not only prevalent in South Africa but countries around the world (Shah & Beinecke, 2009; World Health Organization, 2011). According to the World Health Organization (2011) low-income countries are not spending an equivalent amount per capita on mental healthcare in accordance with their Gross National Income (GNI) in comparison to high income countries. This could possibly be due to high income countries realising the value of quality mental healthcare for the wellbeing and work performance of their people and thus prioritising mental healthcare. This could have an indirect result for countries that prioritise quality mental healthcare to become or maintain their high income.

As South Africa is not currently in a financial position to spend excess amounts on healthcare, and given the dire lack of qualified psychologists in comparison to mental healthcare needs, it is perhaps long past time to look at alternative but effective mental healthcare solutions. Such a solution is discussed later in Chapter 4.

### 3.3 HEALTHCARE INEQUITY

Historically, fragmentation has been a key feature of healthcare services in South Africa. Initially, this fragmentation took the form of the racially segregated healthcare services that were further divided depending on whether the service was deemed to be curative or preventive (Coovadia et al., 2009). The 1919 Health Act gave responsibility for hospital curative care to the four provinces and preventive healthcare to the local authorities



(Coovadia et al., 2009). The apartheid system further entrenched healthcare fragmentation when it created the Bantustans, which each had their own department of health, so that by the end of the apartheid era there were 14 separate health departments in South Africa (Coovadia et al., 2009). Healthcare services in the Bantustans were systematically underfunded by the apartheid government. In 1986/1987, for example, public sector healthcare spending per person ranged from R23.00 in the Bantustans to around R200.00 in the Transvaal (Coovadia et al., 2009). Consequently, in 1994 the newly elected ANC-led government inherited a public healthcare system that was marred by inequalities in the distribution of infrastructure and financial and human resources that needed to be urgently addressed (Coovadia et al., 2009).

More than twenty years after the advent of democracy in South Africa we are still burdened with a large degree of inequality. This inequality is exacerbated by factors such as chronic underfunding, low importance given to the provision of mental healthcare, a small number of qualified psychologists most of whom work in the private sector, and the problem of geographical access to healthcare services in general (Health Professions Council of South Africa, 2017a; Statistics South Africa, 2016a; Ozler, 2007).

As I argued in the previous section there is not only a pull of practitioners – medical as well as psychological – towards the private sector for higher pay, more resources, and less stress, but a push is also occurring. A push towards the private sector caused by lack of available positions is currently occurring (Bantjes, Kagee & Young, 2016). An example of the effect this lack of funded posts has had on mental healthcare in the public sector is the tragedy of the Life Esidimeni project. Originally, 94 mental ill patients were announced as having died due to unnatural causes (Govender, 2017). Since initial counting the number of deaths has been reported to have risen to 143 (Bornman, 2017). These deaths occurred after 1, 371 patients were relocated to numerous Non-Government Organizations (NGOs) – several which did not have the facilities for adequate care – after the cancellation of Life Esidimeni project due to cost-cutting by the Gauteng Department of Health (Govender, 2017). It is the most vulnerable who suffer when care is not taken to address existing issues in infrastructure. It is easy to demand that funding for posts in the public sectors should be made available; however, it is not as easily accomplished.

Although underfunding of mental healthcare is a global trend, within South Africa underfunding is more apparent because of our quadruple burden of disease (Department of

Health, Republic of South Africa, 2013; World Health Organization, 2003) which adds considerable pressure on funding adequate healthcare. With South Africa having the largest HIV epidemic in the world and the largest ARV treatment programme in the world (STATS SA, 2016) there is an urgent need for greater health expenditure as well as cost effective therapies to ensure access for all. In order to reach the targets set by National Mental Health Policy Framework and Strategic Plan 2013-2020 of equal access to all South Africans regardless of race or gender new pathways to access should be explored (Department Of Health, Republic of South Africa, 2013). From the above it is clear that the people of South Africa are in need of accessible and cost effective treatment.

### 3.4 ADDRESSING HEALTHCARE INEQUITY

Legislation that is pertinent to mental healthcare has its beginnings in the guidelines of the South African constitution which emphasise human rights, dignity, and freedom of *all* South Africans (The Constitution of the Republic of South Africa No. 108, 1996). Item 27 of the South African Constitution states that all South Africans have a right to healthcare (The Constitution of the Republic of South Africa No. 108, 1996, p. 1255). Currently it is not possible for all South Africans to access healthcare, including mental healthcare which continues to be a neglected area of need (The Psychological Society of South Africa, 2016).

#### 3.4.1 NATIONAL MENTAL HEALTH POLICY FRAMEWORK AND STRATEGIC PLAN 2013-2020

In 2013 South Africa's first ever national policy plan devoted singly to mental health was developed to "give guidance to provinces for mental health promotion, prevention of mental illness, treatment and rehabilitation" (Department of Health, Republic of South Africa, 2013, p.09). This policy was named the National Mental Health Policy Framework and Strategic Plan 2013-2020 (Department of Health, Republic of South Africa, 2013). Within this document it is noted that mental healthcare services have traditionally been limited to medical intervention for severe mental illnesses while disorders such as depression and anxiety have been neglected (Department of Health, Republic of South Africa, 2013). In the National Mental Health Policy Framework mental healthcare will also be included within

primary healthcare (PHC). According to the international conference on PHC Alma Ata Declaration of 1978 it is required that essential healthcare is made accessible at a cost a country and community can afford, with methods that are practical, scientifically sound and socially acceptable (Department of Health, Republic of South Africa, 2013). Detection and referral of depression and anxiety disorders are noted as areas in need of strengthening in PHC (Department of Health, Republic of South Africa, 2013).

In addition, within the Bill of Rights (Chapter 2 of the Constitution of South Africa), all citizens have a "right to use the language and to participate in the cultural life of their choice" (Constitution of the Republic of South Africa, Act No. 108 of 1996, p. 1257). This could be viewed as a constitutional guarantee that services such as education and healthcare should be provided in the language of the citizen's choosing (Posel & Zeller, 2016).

### 3.4.2 NATIONAL HEALTH INSURANCE

The National Health Insurance (NHI) is a mechanism for delivering universal healthcare (Department of Health, Republic of South Africa, 2011). The NHI is specifically engineered to address inequitable healthcare spending between the private and public healthcare systems in South Africa. The NHI is currently being phased in and primary healthcare is a focus in the initial stages (Department of Health, Republic of South Africa, 2011; Fusheini, & Eyles, 2016). It is believed that the existence of PHC systems within districts is essential for the delivery of basic healthcare (Fusheini, & Eyles, 2016). Importantly, the NHI includes mental healthcare services in the provision of primary healthcare (Department of Health, Republic of South Africa, 2013; Fusheini, & Eyles, 2016). In fact, the National Mental Health Policy and Strategic Plan 2013-2020 was developed with a view to it being integrated into the roll-out of the NHI.

The NHI has eight strategic objectives and mental health services are intended to play a role in each of these objectives. The first objective is to establish district-based mental health services. At these facilities intern psychologists and registered counsellors will be deployed to provide training, supervision and support for the counselling roles of Community Health Workers (CHWs). Thus, psychologists will form part of the specialist mental health team in each district (Tlou, 2013). Institutional capacity building is a second objective of the NHI and this involves the accreditation of the NHI facilities with the HPCSA Professional Board for

Psychology for training psychologists and registered counsellors (Tlou, 2013). A third objective deals with surveillance, research and innovation and NHI facilities will be used to gather data on mental health indicators for the purposes of resource allocation to further develop mental health services (Tlou, 2013). A fourth objective is the development of infrastructure and facilities and this means that therapy rooms, play therapy spaces, as well as equipment and psychometric assessment instruments will be prioritised when planning mental health facilities (Tlou, 2013). A fifth objective focuses on technology, equipment and medicines and this means that facilities will have to be provided with the equipment required to render psychological services such as test materials and information technology equipment (Tlou, 2013). Inter-sectoral collaboration is an objective that will be achieved by engaging role-players outside of the healthcare sector and with non-governmental organisations (Tlou, 2013). Developing human capital is a seventh objective and this will be achieved by ensuring appropriate budget allocations for specialist mental health services (Tlou, 2013). The last of the eight objectives concerns advocacy, mental health promotion and the prevention of mental illness which will be achieved through the establishment of a national public education programme about mental health that addresses stigma and encourages health-seeking behaviours (Tlou, 2013).

To have a functioning universal healthcare system is an aim held by several countries and for good reason; people who are kept healthy have heightened quality of life, are more productive, have less financial stress leading to better mental health outcomes and lower levels of inequality, all of which contribute to national economic growth (Asaria et al., 2016; Barber, & Rosenberg, 2017; Barofsky, 2003). These are understandably highly beneficial reasons for all countries to implement universal healthcare. The question that arises is, ‘Why haven’t all countries fully implemented a universal healthcare system?’ Simply put, not all countries have the financial resources to do so.

In the United Kingdom, for example, which is a highly developed country and the fifth richest country in the world with a much lower unemployment rate and higher GDP than South Africa has been criticised for low quality healthcare services in their National Health Service (NHS) in recent years and this is attributed to a difficult economic climate following the recent global recession (Fox, 2016; International Monetary Fund, 2017; Trading Economics, 2017).

While it is indeed an ethical and globally recognised idea to have a functioning universal healthcare system in place, the South African NHI system has been widely criticised for lack of detailed costing and financing proposals (Serfontein, 2017; South African Medical Association, 2016; The Psychological Society of South Africa, 2016). It has been noted, mostly by professionals working in the private sector who are familiar with its functioning, that the amount of funding required to achieve the same level of quality in the public sector as is found in the private would be immense (Jeffery, 2016). Of course, these practitioners may be biased because they stand to lose income if the NHI is fully implemented as they will need to be contracted to the NHI and the state will determine rates of remuneration. However, while considerable discussion of the NHI is taking place there is still little clarity regarding the specificities of its financing (South African Medical Association, 2016; The Psychological Society of South Africa, 2016). Furthermore, financing of the NHI is a real concern given the current low economic growth in South Africa and the downgrade to sub-investment grade (junk status) of our sovereign credit rating in April and November of 2017 (le Cordeur, 2017; Cronje, 2017) which has seen the withdrawal of several investors that will likely lead to further lowering of the value of the Rand (Mugobo, & Mutize, 2016) which would have a significant negative impact on the costs of healthcare provision.

However, the current state of inequality is unacceptable and whether the NHI system or some other system is implemented the current state of low quality healthcare cannot continue. As funding and the prioritisation of mental healthcare is clearly a challenge under South Africa's current and possible future healthcare system it would be logical to develop interventions that are low in cost but high in efficacy.

### 3.5 CHAPTER CONCLUSIONS

This chapter covered issues in accessing mental healthcare, inequality and means of addressing inequality. The following chapter moves on to discuss how technology as aided mental healthcare, the efficacy of internet interventions, and implementation of internet interventions in South Africa.

## **CHAPTER 4: E-HEALTH**

### **4.1 CHAPTER OVERVIEW**

In this chapter I discuss the development of the use of digital technologies in mental healthcare services. The discussion provides an overview of how technology came to be used in mental healthcare services and considers the implications for therapeutic alliance. In addition I discuss the efficacy of internet-based interventions and consider the feasibility of the development of digital technologies in mental healthcare services in the South African context.

### **4.2 TECHNOLOGY-MEDIATED MENTAL HEALTH SERVICES**

As with most other disciplines technology has had a profound impact on mental healthcare practice (Eysenbach, 2001; Cline & Luiz, 2013). With regards to psychological services technology enabled access to psychological support through ‘agony aunt’ letters in newspapers and magazines that allowed individuals to ask for advice on a range of issues under the guise of anonymity. From there, technology advanced to the point where the term e-health was coined. In the discipline of healthcare technological platforms fall under the term e-health which is a shortening for electronic-health, comprising of all electronic-based healthcare (Eysenbach, 2001). Radio call-in shows also provided a platform for similar modalities of psychological support. Toll free telephonic helplines also increased accessibility to psychological counselling, such as the services provided by Lifeline, Rape Crisis, and Childline – toll-free telephone counselling services. Arguably, the growth of these services evidences a response to a need for more accessible psychological support. In other words, these services indicate that there is a gap between mental healthcare needs and the availability and accessibility of services. Importantly, call centre services such as these are manned by volunteers who do not have formal clinical training.

However, it appears that, in recent years, a growing number of professional mental healthcare providers recognise the potential of technology to improve service delivery. In South Africa a national survey of registered psychology practitioners it was found that 31.3% of clinical

psychologists, 29.8% of counselling psychologists, and 15.9% of registered counsellors indicated that they conduct internet-based consultations (HPCSA, 2017a). This shows a natural progression towards the use of the internet to seek and provide psychological services. One of the reasons behind the uptake of internet-based contact for psychological support is that it enables contact in the periods between face-to-face sessions. Thus, rather than replacing the need for face-to-face psychotherapy, the internet allows clients and clinicians to maintain contact for the purposes of brief follow-up and report back. In relation to the scheduling constraints of face-to-face meetings, internet-based contact may be viewed as supporting greater synchronicity. Therapist e-health communication is enabled by a range of technological means such as email, text messages, telephone and video calls.

In the past two decades there has been increasing interest in the use of the internet for the delivery of interventions designed to prevent and treat mental disorders such as anxiety and depression (e.g. Johansson & Andersson, 2014; Klein & Richards, 2001; Perini, Titov, Andrews, Choi, & Schwencke, 2009; Silfvernagel et al., 2017). Although internet-based interventions are a new phenomenon, the findings of research in this area suggest that internet-based interventions do not involve the development of new therapeutic approaches (Königbauer, Letsch, Doebler, Ebert & Baumeister, 2017). What is required is adjustment to conventional therapies so that the same principles underlying conventional therapies inform internet-based interventions (Klein, Richards, & Austin, 2006; Spence, Holmes, March & Lipp, 2006). In Chapter 2 I stated that the preferred and most commonly used therapeutic approach for depression and anxiety disorders is Cognitive Behavioural Therapy (CBT), and so it is not surprising that this approach informs many internet-based interventions for anxiety and depression disorders (Griffiths et al., 2010). I note here that when this treatment approach is used in internet-based interventions it is sometimes identified as internet-based CBT or iCBT (Klein et al., 2006; Spencer et al., 2006). This treatment method can thus be described as an adapted version of traditional face-to-face therapy that is conveyed via the internet platform.

Cline and Luiz (2013) argue that progress in the use of digital technologies in healthcare settings lowers the costs of providing healthcare while increasing accessibility. There is evidence to support this claim with regard to internet-based interventions for anxiety and depression (Sue et al., 2013). Indeed, it is for these reasons that internet-based interventions are growing in popularity worldwide (Sue et al., 2013). Evidence also suggests that young

people prefer internet-based health services that are accessible on their mobile phones (Hampshire et al., 2015). While this is largely as a result of the greater levels of privacy afforded by mobile technology, it is also important to bear in mind that, in general, there is increasing use of smartphones to access online information because they are less expensive and more mobile than desktop computers and fixed-line internet connections. It was expected that by 2014 80% of phones use in South Africa would be smartphones (Jones, as cited in Dalvit, Kromberg, & Miya, 2014). Data released by Statistics South Africa (2013) indicates that internet-capable smartphones have drastically increased internet access in South Africa and that landline internet connections remain relatively inaccessible to the majority of South Africans.

With growing availability and access to online health services, the question then moves to whether or not internet-based interventions are effective in the treatment of depression and anxiety disorders. From my review of the literature it appears that opinions vary on this issue. There is some concern that internet-based interventions may cause damage if they do not correctly diagnose depressed patients with suicidal tendency, while others argue that internet-based interventions will reach those individuals who would not otherwise have accessed treatment and who may at least be assisted in some way or provided with information that they would otherwise not have received (Proudfoot, 2004). It is also possible that internet-based services may be used to persuade individuals to seek further (face-to-face) help (Sue et al., 2013). In the next section I review the literature pertaining to these issues.

### 4.3 EFFICACY OF INTERNET-BASED INTERVENTIONS

When internet-based interventions for the provision of psychological services were first proposed many mental healthcare professionals were sceptical about this modality. Questioning should, arguably, always occur when any new treatment platform comes into being. If questions are not asked then a space is left open for error to occur. And, in the field of psychology, these errors could cause immeasurable harm to already vulnerable human beings. Efficacy of internet-based interventions for depression and anxiety could not be assumed on the basis that they adopted the same treatment approaches (e.g. CBT) as was used in conventional face-to-face treatment encounters. There have been concerns that some nuances of internet-based interventions could have a negative impact on efficacy. A key issue



that was assumed would lower efficacy was changes to the therapeutic alliance that internet-based services would – it was assumed – occasion (Andersson et al., 2012; Bee, 2008). I discuss the issue of therapeutic alliance in more detail in 4.4.2. The reason I mention it here is that concerns such as this suggested that research was needed to establish the efficacy of internet-based interventions before they were widely adopted.

Just as any other new therapeutic modality would have to prove its efficacy through research the same has been true of internet-based interventions. Internet-based interventions for depression and anxiety have proven to be at least as efficacious as conventional face-to-face modes of therapeutic intervention. Equal outcomes have been found in studies on panic disorder (Bergström et al., 2010; Carlbring et al., 2012; Kiropoulos et al., 2008 ), social anxiety disorder (Hedman et al., 2011), and subclinical depression (Spek et al., 2007). Systematic reviews conducted in 2006 (Griffiths & Christensen, 2006) and 2010 (Griffiths et al., 2010) of RCTs of the efficacy of internet-based interventions for anxiety and depression indicated evidence of efficacy relative to controls. The results of the systematic review conducted by Griffiths et al. (2010) indicated that of the 26 trials reviewed, 23 trials demonstrated efficacy relative to controls, with effect size differences ranging from 0.42 to 0.65 for depression interventions involving participants with clinically significant symptoms of depression and 0.29 to 1.74 for anxiety interventions involving participants with a diagnosed anxiety disorder. The authors conclude that internet-based interventions for depression and anxiety disorders offer promise for use both as self-help applications and as an adjunct to conventional care (Griffiths et al., 2010).

#### 4.4 IMPLEMENTING INTERNET-BASED INTERVENTIONS IN THE SOUTH AFRICAN CONTEXT

South Africa is a country that has certain salient characteristics that are relevant to this topic. These include: high cultural and language diversity, high rates of poverty, high unemployment, large financial and educational divides, insufficient funding for primary healthcare interventions, mental illness stigma, increasing (but still fairly limited) internet connectivity (Statistics South Africa, 2016b). These characteristics could have an impact (both positive and negative) on the efficacy and appropriateness of internet-based mental health interventions. To illustrate, cross-cultural validity of internet-based mental health

interventions would be of concern in a culturally diverse country such as South Africa as there is always the potential that an intervention may be biased against a particular cultural grouping. Education and digital literacy is also a concern in terms of being able to successfully access and navigate a mental health intervention application. And, of course, internet connectivity is a vital prerequisite for accessing internet-based interventions. Arguably, for an internet-based intervention for mental healthcare to be appropriate for implementation in the South African context then factors such as these need to be taken into account. Each of these concerns is discussed in more detail in the sub-sections below.

#### 4.4.1 OVERCOMING STIGMA

Experiencing mental health related stigma, or any form of stigma, can be so highly unpleasant that people may avoid seeking help. In South Africa, stigma may be entrenched by such acts as occurred in 2016 when it became known that 94 mentally ill patients had died unnatural deaths; the Life Esidimeni project (Govender, 2017). This was not South Africa's only incident to see the mentally ill being mistreated/abused. Tower Psychiatric Hospital in the Eastern Cape has been reported as being in such a deplorable state of functioning that it has been noted to need observation to prevent a similar incident to that of the Life Esidimeni project crisis (Tandwa, 2018). The psychiatric hospital (Fort England Psychiatric Hospital) in Makhanda/Grahamstown, Eastern Cape, came under scrutiny when it was found that a patient was physically beaten by the hospitals staff (Cleary, 2018). Stigma could be arguably created by observing the treatment of these vulnerable patients, which could lead to avoidance of help-seeking behaviour in an attempt to avoid being placed in a similar situation. Of course, mental healthcare institutions are meant to help people, and it is probable that the few instances where they do the opposite would be salient in contrast.

There have been numerous interventions, mostly non-internet, that attempt to tackle stigma of mental illness with varying results of success (Buechter, Pieper, Ueffing, & Zcschorlich, 2013; Griffiths, Carron-Arthur, Parsons, & Reid, 2014; Gronholm, Henderson, et al., 2017; Thomas et al., 2015). Non-online intervention methods vary but largely involve education, making contact with those whom are being stigmatised, and protesting with the goal to subdue stigmatising behaviours (Buechter et al., 2013; Griffiths et al., 2014; Gronholm, Henderson, et al., 2017). The Griffiths et al. (2014) review of stigma reducing intervention,

both online and not, reported 10 of the 14 interventions delivered via the internet to be successful post-test.

The emerging addition or alternative to mental healthcare through institutions, internet-based therapy, could see a decrease of the lived stigma felt by patients. In general it is better to combat stigma by being transparent in the use of and asserting the value and benefits of seeking psychological help (Buechter et al., 2013; Gronholm, Thornicroft, et al., 2017). This is not always possible for those who feel isolated due to the degree of stigmatisation they experience. For those who would not normally come forward for help, those severely affected by stigmatisation, internet-based interventions could offer the privacy required to encourage help-seeking behaviour. Internet-based interventions conductors could add a component to their design that directly deals with the reduction of stigma felt by the participants, if they feel it is needed. However, the simple act of using an internet-based intervention rather than face-to-face care could prove to lessen the felt stigma of the participants. This is due to the nature of internet-based interventions. Participants need not travel to known psychological care institutions and therefore would not be seen there by those who would stigmatise and discriminate against them. If participants have access to a private device (smartphone) to engage with the intervention no one would see any application to indicate that the person was seeking psychological aid. If they do not have access to a private device, or if the intervention forms part of outpatient care, passwords to open such intervention applications would prevent unwanted disclosure of the content of the therapy. In addition, the privacy of participants could be protected by allowing them to register under a false name/ pseudonym, as long as correct contact details are given in case of emergencies. For those who struggle with mental illness related stigma internet-based interventions could be a doorway to mental healthcare that they would never have otherwise accessed.

#### 4.4.2 IMPLICATIONS FOR THERAPEUTIC ALLIANCE

Therapeutic alliance is defined as the professional relationship of trust between a mental healthcare practitioner (agent of change) and their client (seekers of change) (Bordin, 1979). For a number of decades, the therapeutic relationship, or therapeutic alliance, has been held as a cornerstone of successful psychological interventions (Andersson et al., 2012; Bordin, 1979; Horvath & Greenberg, 1994). With regards to the role of the therapeutic alliance in

internet-based interventions for anxiety and depression, there is a lot of variation in terms of the degree of therapist input from one intervention to another. Furthermore, unlike conventional therapeutic interventions, in internet-based interventions therapist input may not even be in person. Nevertheless, it can still be argued that there is therapeutic interaction if the therapist responds, for example, to e-mail messages that encourage patient engagement in the intervention programme (Paxling et al., 2013). Thus, development and maintenance of a therapeutic alliance may not necessarily require direct contact with a therapist. Andersson et al. (2012) argue that, as therapeutic alliance is partly based on client expectations regarding the task and goals of therapeutic engagement, that while the relationship between a therapist and patient is likely to be different in internet-based treatment compared to conventional therapeutic engagement, that those expectations regarding tasks and goals still exist. Consequently, the authors argue a therapeutic alliance is still possible in internet-based therapies that provide individualised encouragement on progress and which respond to difficulties encountered in the process of working through self-help material (Andersson et al., 2012). Furthermore, self-help materials can include aspects that facilitate the formation of a therapeutic alliance and a client may perceive an understanding clinician who is behind the material encountered online (Richardson, Richards, & Barkham, 2010).

The findings of recent research indicate that the efficacy of the therapeutic alliance in internet-based interventions for anxiety and depression is equal to that seen in conventional face-to-face therapy (Berger 2017; Kay-Lambkin 2017; Andersson et al., 2012; Knaevelsrud & Maercker, 2007). Interestingly, although Andersson et al. (2012) found that clients gave similarly high ratings for therapeutic alliance in internet-based treatment as conventional therapeutic treatment there was little evidence that this translated into improved treatment outcomes for internet-based interventions. Berger (2017) argues that this may be because a working relationship may be less important in internet-based interventions. Internet-based interventions, for example, may attract individuals who are specifically looking to avoid face-to-face therapeutic encounters. Such individuals may be more comfortable with the privacy and the relative anonymity provided by internet-based interventions and this environment would thus be more congruent with their own particular expectations and personal comfort. However, it is my belief that it could be possible that having a mental health application on one's smartphone or computer could create a sense of having a *constant presence* of support. Persons would not need to wait for an appointment or travel to a therapist to seek benefit. Depending on the design of the internet-based intervention, an intervention application that

has both online and offline accessibility on one's smartphone could allow for more of a sense of constant presence of therapeutic support. Such a presence could possibly help individuals to have that emotional connection to their therapy that would allow them to engage more fully.

#### 4.4.3 IDENTIFYING ELEVATED SUICIDALITY

Worldwide over 800 000 people die each year by suicide, amounting to 1.4% of all deaths (World Health Organization, 2018b). In addition, around 20 to 30 times as many suicide attempts that do not result in death occur. Although suicide can occur at any point in the lifespan, it is the leading cause of death among young people aged 15 to 29 years (World Health Organization, 2018b). Consequently, suicide prevention is a public health priority in many countries and national prevention programmes have encouraged considerable research into suicide detection and treatment, and management of people at risk for suicide.

Interestingly, although there was some concern in the early days of the emergence of internet-based interventions that they might inadvertently cause harm if they did not correctly identify and provide assistance to individuals with elevated suicidal tendency (Sue et al., 2013), in recent years, internet-based interventions have become central to suicide prevention efforts.

The reason for this could be the same as with other individuals who are so fearful of experiencing the discrimination of mental illness stigma that they refrain from seeking help through conventional face-to face therapy, as was discussed in 4.4.1. The fragile emotional state of people experiencing suicidal ideation combined with the fear of experiencing stigma in that state could prevent them from seeking conventional help. Not only relief from stigma but also ease of access and the possible sense of a 'constant presence' of therapeutic support, as discussed in 4.4.1, could be adding to the attraction of internet-based interventions. It may be easier for them to seek aid whilst in the comfort of their own home, away from judgmental eyes, in the same way that suicide prevention call-centres are favoured.

There have been a number of studies that indicate internet-based interventions are effective in reducing suicidal ideation (Hetrick et al., 2017; van Spijker, Callear, Batterham, Mackinnon, & Gosling, 2015; van Spijker, Majo, Smit, van Straten, Kerkhof, 2012). Many such studies

are focused on youths, as they experience a high incidence of suicide (Hetrick et al., 2017). By youths I refer to persons in and near their teenage years roughly from the ages of 11 to 20. Of course refinement of such studies could help save lives, refinements such as were made to the van Spijker et al. (2015) study: a larger degree of anonymity for participants, and longer follow-up times to test the duration of effectiveness. Although, van Spijker et al. (2015) do note that they could not tell if drop-out was due to a completed suicide, and this could be due to anonymity. Anonymity should therefore preferably be allowed in such a way that the person is still contactable, even if it means making it an option for participants to give a next-of-kin/ trusted-friend's telephone number. In this way internet-based interventions for suicidal ideation could continue to improve and remain at the forefront of reaching those who would otherwise not be helped.

#### 4.4.4 CROSS-CULTURAL ADAPTATION

South Africa is a multicultural nation with a history of cultural oppression and is still in a state of addressing the resulting animosities (Steyn, Tsekwa, & McEwen, 2017). Such a wide variety of cultures would likely have an effect on cross-cultural adaptation of internet interventions. Care and attention to cultural details could possibly change the interaction of participants within such interventions.

The different cultures found in South Africa could hold different beliefs and concepts of the mind. Certainly, culture affects how we experience mental illness in 'expression, course and outcome' but also in 'help-seeking and the response to health promotion, prevention or treatment interventions' (Kirmayer, 2012, p.149). Cromby et al. (2013) notes that differences in diverse cultures may be expressed either somatically, or as emotional and cognitive aspects, or both, but vary from culture to culture. For instance, Western cultures tend to experience sadness as excessive tiredness and concentration difficulty (Cromby et al., 2013). Conversely, there are incidence where psychological disorders coming from different cultures mirror each other but are given different names and aetiologies. Cromby et al. (2013) writes of a study by Kleinman in the mid-1980s concerning the Chinese diagnosis of neurasthenia which mirrored the symptoms of depression so closely that the majority of the participants met the criteria for major depression. The difference being that the aetiology of neurasthenia

was considered to be neurological in nature and not caused by external factors as depression often is (Kleinman as cited in Cromby et al., 2013). This is possibly due to cultural differences that erroneously rule out external factors as in that culture they could be seen as solvable through hard work and sheer will power.

When psychologists give heed to cultural competence by noting the importance of the different cultural experiences of mental illness they are better positioned to improve the appropriateness and effectiveness of interventions (Kirmayer, 2012). According to Kirmayer (2012) cultural competence has become a term in mental healthcare for strategies that deal with the challenges of cultural disparities in mental healthcare. To be culturally incompetent would then mean that a psychologist or intervention would be inappropriate to treat cultures outside of their familiar culture. Sue, Zane, Hall, and Berger (2009) gave a similar understanding of cultural competence and emphasise the growing need for it to protect the effectiveness of treatment across cultures.

All of South Africa's cultures would benefit from psychological health care, but psychological care may not always be as effective in cultures that its psychometric tools and theories were not developed on (Ganz, Neville, & Ward, 2017). Many psychological instruments are limited in their scope of measuring cultural differences, and are at the same time etic, having been imported from other countries where they were normed on groups that may have vast differences in language usage, culture, and knowledge systems creating a bias in favour of the normed group (Laher & Cockcroft, 2013). Norming etic interventions/instruments on new groups is at times possible and can correct for biases (Laher & Cockcroft, 2013). It is imperative, given the above, that effort be made to either adapt etic assessments or develop emic assessments for South Africa's numerous cultures for more accurate assessment.

Psychometric testing has advanced with the understanding that the tests need to be normed with the target group before the test can be seen as fair and accurate (Roodt, 2013). This has become a wide area of research in South Africa, with most researchers focusing on adapting and norming pre-existing tests instead of developing new ones (Lucas, 2013). Emic – locally developed – psychometric tests are rarely developed in South Africa due to the massive cost, time, and effort constraints required to create the dense body of research needed, but also because of a skills shortage in test development (Laher & Cockcroft, 2013). Currently it is seen as standard to norm pre-existing tests on new groups, while working towards tests that

are less culturally weighted for cross-cultural use (Laher & Cockcroft, 2013; Lucas, 2013). Therefore, in regard to cultural transformation within psychology there is evidence that Western psychology practices can be adapted to be effective cross-culturally (Baron, Davies, & Lund, 2017; de Bruin, Swartz, Tomlinson, Cooper, & Moltenlo, 2004; Fike, Knoetze, Shuttleworth-Edwards, & Radloff, 2012; Hinsberger et al., 2017; Mellins et al., 2017).

Cross-cultural validity, which is an element of this review in its usefulness to utilise etic internet-based interventions within the South Africa context, can be assessed according to the information given by the included studies. The results of studies that were designed for use as cross-cultural interventions may give insights into how a cross-cultural internet-based intervention could be developed for South Africa, or if separate cultural specific internet-based interventions are required. If the sampling and context characteristics of these cross-cultural studies are similar to the ones found in South Africa, then it would stand to reason that such an intervention could be imported and used in South Africa after making fine-tuned adjustments. If finances and time were not barriers in intervention development, then an emic internet-based intervention for depression and anxiety disorders in South Africa could more easily be produced. If South Africa's finances were not an issue barriers to mental healthcare such as cultural and language differences could more easily be address through tailored design of online mental health interventions.

#### 4.4.5 LANGUAGE

South Africa's multicultural status comes with the use of multiple languages, having 11 official languages (Statistics South Africa, 2016b). Use of language in such interventions could understandably have impact on understanding of the material given. The effects of language in conducting interventions in South Africa or any country cannot be underestimated. Even when language is not an outcome to be measured in interventions, its affects upon outcomes must still be considered (Lucas, 2013). For instance, if an intervention was conducted using English as its medium participants who were fully literate in English would possibly be able to interact with the intervention on a more meaningful level, as they would not have a language barrier to the interaction. However, if a participant was not proficient in English their responses could be slower and less accurate due to misunderstandings and frustration, thus invalidating the results of the intervention causing



possible damaging misdiagnoses. Van den Berg (2016) is concerned with language barriers effect on health care in South Africa. Misunderstandings caused by miscommunication negatively affect South Africa's healthcare services (van den Berg, 2016). These miscommunications can develop from differing educational levels between patients and their health care providers and from cultural nuances present but non-salient in language.

Our country South Africa has 11 official languages, but more than those are in use including, Sepedi, Koi, Nama, and San (Statistics South Africa, 2016b). Posel and Zeller (2016) note the increase in bilingualism of non-white South Africans as English is generally seen as a language of access empowerment, towards work and education. There has been concern that a language shift would occur whereby English would be used in preference to Bantu languages but as Posel and Zeller's (2016) study shows, the use of Bantu languages also increased along with the use of English over the analysed period. Posel and Zeller's (2016) believe this indicated a trend towards bilingualism instead of a language shift. While this may be the case in South Africa it is still widely held that where education is concerned barriers to learning occur when the medium of teaching is not the learners' home language (Fenza, 2016; Makgato, 2015). This is also the case in psychological education and is evident in health care interactions in South Africa (van den Berg 2016). Therefore, bilingualism and multilingualism may perhaps hold benefit in instances where cost would prevent sole use of home languages.

South Africa is linguistically diverse and no one home language exists that is spoken within all South African homes. A focus on languages spoken outside the home that are cross-cultural would therefore be prudent. Statistics South Africa (2018) provides figures of languages spoken outside of homes in relation to home languages. IsiZulu is reported to have the highest instance, 25, 1%, of being spoken outside of the home in relation to other languages spoken in South Africa (STATS SA, 2018). However, this is due to the size of the isiZulu home language demographic. 30.8% of black Africans are reported to speak isiZulu outside the home, whilst 31.1% are isiZulu home language speakers (STATS SA, 2018). The instances of other population groups speaking isiZulu either as a home language or outside of the home are drastically lower. Coloured South Africans are reported to speak isiZulu less than 1% either as home language (0.3%) or outside the home (0.3%) (STATS SA, 2018). White South Africans show similar statistics at 0.5% as home language and 0.5% outside the home (STATS SA, 2018). Indian/Asian South Africans are reported to stand at 0.9% as home

language and 1% spoken outside the home (STATS SA, 2018). When a comparison across the other languages is made it becomes clear that isiZulu is largely being spoken outside of the home only by those who speak isiZulu as a home language.

The second most spoken language outside of the home, English, is spoken more readily across population groups. The statistics for English use in each population group are as follows: black Africans (home: 1.6%, outside: 8.6%); Coloured South Africans (home: 20.1%, outside: 28.3%); Indian/Asian South Africans (home: 92.1%, outside: 95.8%); and white South Africans (home: 36.3%, outside: 61%) (STATS SA, 2018). As one can gauge, English has a higher degree of usage across population groups in comparison to isiZulu, which may be the most spoken language in South Africa but largely only by South Africa's Zulu population.

A similar, but lower, result is seen with the statistics for Afrikaans across the population groups, black Africans (home: 0.9%, outside: 1%); Coloured South Africans (home: 77.4%, outside: 68.8%); Indian/Asian South Africans (home: 1.3%, outside: 1.5%); and white South Africans (home: 61.2%, outside: 37.2%) (STATS SA, 2018).

These statistics show that English and Afrikaans are the most widely spoken languages outside of the home, across South Africa's diverse populations. IsiZulu is the third most widely used language across populations (STATS SA, 2018). The use of English, then Afrikaans, and then isiZulu in internet-based interventions for South Africa can therefore be seen to have a higher potential for cross population equality. When South Africa reaches a point where it can afford the translation and maintenance of websites in many different languages it should do so in the interest of all of South Africa's populations.

This information, along with South Africa's colonial history of Western education systems and employment arriving from English and Afrikaans speaking cultures, can give understanding as to why psychological interventions have generally been conducted in English or Afrikaans. English and Afrikaans became wide spread through the process of colonisation and they have been held as gatekeepers to education and employment. However, transformation towards equality in South Africa requires a change in these practises. Adaptation of psychological interventions as well as assessment instruments to include factors, such as the participants' home language, begun in earnest in South Africa after the end of apartheid to avoid cultural bias (Akande, 1998; Bartram, van de Vijver, & Fons, 2016;

Ecowas, Adewuyi, & Akande, 2011; Nell, 1999; Shuttleworth-Edwards, 2016). As van den Berg (2016, p. 229) writes, “To complicate matters further, language can never be separated from culture”. Nuances in understanding of concepts and world views are altered through the use of language and languages are tied to cultures and their subcultures. For example, the simple Western metaphors ‘I’m feeling blue’ or ‘it’s a piece of cake’ could easily be misunderstood if one is not aware of the culture specific use of those metaphors.

Given the above it would be more within keeping of the needs of South Africa if future psychological interventions, including internet-based interventions, continued to move towards using the full range of languages found within South Africa. However, given the financial crisis that South Africa is currently experiencing it would perhaps be wise to begin by adding the next most widely spoken and most commonly spoken languages and then continue to include others as adapting and developing interventions can be costly Provincial interventions where development includes use of the most spoken language in that province could also be an effective strategy, especially in the event of neglected groups, but in using the platform of the internet, these interventions would reach greater numbers and areas initially by beginning with widely and commonly spoken languages. As our Constitution submits, South Africans should be free to use language of their choosing to engage in all the aspects of their lives (The Constitution of the Republic of South Africa No. 108, 1996).

#### 4.4.6 EDUCATION

Education has an impact on how we engage with the world around us. If we have little knowledge of a subject, such as the internet and its’ use, we would struggle to make full use of it. In this regard levels of education in South Africa give us a glimpse into potential future participants’ ability to make full use of internet-based interventions. In The Global Competitiveness Report 2017-2018 statistics are given on South Africa’s quality of education systems for higher education (including secondary education) when compared to other countries (Schwab, 2017). The report ranks South Africa as 114 of 314 countries in terms of quality of education systems (Schwab, 2017, p. 269). The global report also gives values for comparison that instructed ranking, which are indicated by a scale of 1 to 7 with 7 being the most favourable. In comparison to Switzerland (Rank 1 in quality of education, value = 6.2) South Africa can be seen to have low quality education systems with a value of 2.6 (Schwab,

2017). Nationally this would indicate a low level of education compared to global standards, at least at the secondary school level and below. Evidence of this can be seen in the 2016 Progress in International Reading Literacy Survey where South Africa was ranked last when compared to 50 other participating countries; national literacy of Grade 4 learners (Howie et al., 2016). Howie et al. (2016) report that English and Afrikaans scores were the highest, which could possibly point to a lack of resource material (reading books) and inadequately trained teachers for the eight other languages assessed.

In addition, a study cited in Cromby et al. (2013) found that individuals were more likely to be diagnosed with depression in adulthood if their parents were poorly educated (Ritsher, Warner, Johnson, & Dohrenwend, as cited in Cromby et al., 2013). Of this group, if the parents were poorly educated and worked in manual labour/ unskilled positions their children were three times more likely to be diagnosed with depression than the control, at some point in their adult lives (Ritsher et al., as cited in Cromby et al., 2013). If one applies this finding to the South African context where the majority of South Africans still do not receive adequate education and where many work in manual labour/unskilled positions one can visualise just how large the need for mental health care is in South Africa (Schwab, 2017; Statistics South Africa, 2016a).

In regard to participants making useful sense of internet-based interventions level of education within South Africa is of importance. For instance, if a participant has little or no understanding of the theoretical concepts being raised within the interventions, or being digitally illiterate, this could affect outcomes of the programme. Digital literacy refers to a person's ability to use and communicate clearly on digital platforms, usually, but not limited to, the form of writing. In order to communicate clearly over the internet (digital literacy) one would need to be able to read and write clearly. It stands to reason that if South Africans struggle with reading and writing literacy, as noted above, digital literacy would likewise be an issue. In addition, e-health literacy, the ability to use information and communication technological advances to improve one's health (Neter & Brainin, 2012), would include digital literacy within it. Instances of e-health illiteracy could increase therapist time spent on securing understanding of the intervention rather than on therapeutic progress; if therapist input forms a part of the programme. Unfortunately it would seem that South Africa's low level of quality education could be a concern in digital literacy, a concern that would need to be addressed.

#### 4.4.7 THE DIGITAL DIVIDE

Digital literacy, in the context of health and healthcare, refers to a person's ability to make use of information and communication technologies in order to improve their health (Neter & Brainin, 2012). If a person has not had the opportunity to learn how to use such technology they could very well find themselves at a disadvantage when attempting to engage in an e-health programme. In that instance the person would be attempting to simultaneously learn how to use the new technology while trying to focus on the programme; this would mean less mental focus on progressing in the programme. A lower level of focus on the programme could affect the results. Frustration could be caused in the participant in having to focus on the technology, and this frustration could potentially have a negative impact on their participation in the programme. Those who have been able to financially afford such technology (such as smartphones or laptops), and are experienced in using it, would logically be more comfortable using it as a platform for healthcare and thus stand a higher chance of gaining the full benefits of the programme (Neter & Brainin, 2012). This would result in different outcomes between those participants who are familiar with using technology (i.e. digitally literate) and those who are not (i.e. digitally illiterate).

E-health can be assessed with tools such as eHEALS, which measures the comfort and skill of persons attempting to engage with e-health services (Norman & Skinner, 2006). Within South Africa this divide is not as wide as one might originally think when looking at the requirements for an internet-based intervention. It is true that most South African's cannot afford to buy a desktop or laptop computer but many own budget smartphones that allow them access to the internet (Statistics South Africa, 2016b). In this way if internet-based interventions for South Africans are designed for smart phone users then the divide between those who are familiar with the technology and those who are not would decrease greatly. However, access to an internet-capable device is not the only factor. The cost of operating such devices must also be taken into consideration. In this regard it is important to consider the fact that internet data is exorbitantly expensive in South Africa where one mega bite of data costing between 99c and R2.00 depending on one's choice of carrier and data plan (Mochiko, 2017). In spite of the expense internet access has steadily grown to 60% coverage across South Africa (Statistics South Africa, 2016b).

Unfortunately, access to the internet is not only limited by high data costs but also as a result of poor signal coverage. Reporting on cellular coverage in South Africa, Gillwald, Moyo and

Stork (2013) note that network coverage concentrates on metropolitan areas, leaving many rural mobile users with intermittent and slow network access. Despite these challenges, smart phone usage is increasing across South Africa and recent data suggests that young South Africans are comfortable in seeking medical advice via the internet (Hampshire et al., 2015). This preference could perhaps be extended to psychological care, especially its ability to reduce stigma.

Data limitation may be a factor that could limit engagement, if not desire, in internet-based interventions in South Africa. This challenge would need to be overcome without adding to the cost burden of the Health Department by paying for participants' data coverage. Especially as there is no way of knowing if participants would spend data credits on the internet-based intervention site or alternative sites, such as Facebook.

Digital literacy and one's ability to afford the access and maintenance of one's digital literacy is not the only factor of concern in South Africa's digital divide. E-health literacy is another factor. E-health literacy is not only based on one's ability to utilise technology (digital literacy) but on the ability to utilise it in a manner that benefits one's health. The knowledge that one can and how to seek help through electronic means. In order to have high e-health literacy one would need to know how best to use available technology to improve one's health. One study confirmed the hypothesis that high e-health literacy is found more in the younger and the more recently educated than with the elderly (Neter & Brainin, 2012). Not necessarily only the elderly population but those with chronic illness were found to have lower e-health literacy, although it is not clear if this is a causal relationship (Neter & Brainin, 2012). One can understand a literacy divide between a generation that grew-up operating technologies like computers and cellular phones and those who did not. An attachment to technology may have formed for the younger generations that simply was not present for the older generations. There may therefore be more of an inclination in younger generations to fully utilise technology. As Blanchard, Hosie, and Burns (2013) allude that young people are making use of technology to expand their perceived world in communication, such as by social media. It would seem that young people more readily accept technology as part of their everyday lives. Tennant et al. (2015) likewise reports that the younger more educated in their study had higher e-health but that older generations were increasingly making more use of technology for healthcare. It would seem that although younger generations are more familiar with technology through frequent use older

generations are increasing their usage as they see benefit in doing so. If this pattern of behaviour hold true in South Africa, and there is no strong reason to believe that it won't, young South Africans would be the first to take up internet-based mental health interventions. Older persons may need more encouragement to participate and perhaps digital literacy aid if they are not familiar with the technology. In addition, the study did not find any gender differences in e-health literacy, although they did not draw conclusions from this (Neter & Brainin, 2012).

Factors such as digital literacy and cost of having and maintaining internet access are highlighted by financial and educational disparities in South Africa. As we are still recovering from the damaging past of Apartheid many black South Africans remain in dire financial straits, and struggle to afford new technologies (Statistics South Africa, 2013). In addition, a disparity remains in South Africa's education system in a similar way to our healthcare system. South Africa's financially affluent can afford quality private school fees for their children, while those unable to afford such fees must make use of the poorly underfunded public school system, which facilitates a far lower quality of education (Meek & Meek, 2008). These factors need to be addressed in the development of any internet-based intervention for South Africa for mental health or otherwise.

#### 4.4.8 AFFORDABILITY

In addition to the cost of internet data, cost of the internet-based interventions themselves must be considered. The experience of other countries has been that internet-based interventions allow for lower costs in general due to reducing travel costs and in terms of minimising the need for costly face-to-face consultations (Paganinia et al., 2018).

The Griffiths et al. (2010) review noted that of the five English language based programmes that they reviewed three were free to use by their public and two were available at a low cost. A cost analysis for development and smooth running of an intervention would need to be undertaken to reach conclusions concerning costs to future South African users as it is beyond the scope of this research. In order for an internet-based intervention to be made available to the public for free, or even at low cost, funding would need to be made available for development and maintenance. If funding were sourced from the government for development the results of that funding (the intervention) would have been developed with

tax payer money from members of the public. As I argued in Chapter 2 this would mean that the public would have essentially paid for the development of that intervention and should therefore have rights to use it. It could not be developed with tax payer funds and then be withheld from the public. Charging high rates for use so that only a portion (private sector) of the populous can afford treatment would in that instance be unethical and counter-productive.

#### 4.5 CHAPTER CONCLUSIONS

This chapter covered the use of technology in mental healthcare. It discussed technology mediated forms of mental healthcare, and the efficacy of internet-based interventions for mental healthcare. It also covered factors important to the South African context in implementation of such intentions. The following chapter details how this research was undertaken and why.



## **CHAPTER 5: METHODOLOGY**

### **5.1 CHAPTER OVERVIEW**

In this chapter I discuss the aims of my research and the design and methodology employed to achieve these aims. I detail how I collected, screened, and selected the data for the systematic review, and how it was analysed. I detail how I made use of the results of the systematic review and compared them to the needs of South Africa. In that comparison a list of factors emerged that could be used in development of internet interventions for depression and anxiety disorders in South Africa. Limitations, reliability and validity, and ethics are also addressed in this chapter.

### **5.2 RESEARCH AIMS**

My research had two main aims: (A) to provide an updated review on the efficacy of internet-based interventions for depression and anxiety disorders, and (B) to ascertain the possibilities and limitations for their feasibility in the South African context.

I achieved the first of these two aims by replicating the systematic review methodology of the Griffiths et al. (2010) examining the efficacy of internet-based interventions for anxiety and depression. Griffiths et al. (2010) was not focused on interventions either from low income or high income countries when collecting their data. Level of country income was not one of their pre-set inclusion criteria, allowing them to collect data across financial divides (Griffiths et al., 2010). Unfortunately, no studies from low income countries met the criteria for inclusion in the Griffiths et al. (2010) review. This is unfortunate because such studies would have made for easier comparison to South Africa's context. Arjadi et al. (2015) conducted a systematic review that found three low income studies on mental healthcare internet interventions. Although none made use of a control group rendering those studies low quality (Arjadi et al., 2015). A control group allows for a minimisation of effects caused by variables other than the independent variable and therefore allows researchers to draw more accurate conclusions (Jackson, 2009). It is understandable that Griffiths et al., (2010) would reject such studies in order to retain a high standard of systematic review. Both the Arjadi et al.,

(2015) and Griffiths et al., (2010) systematic reviews show the severe lack of quality studies being conducted on mental healthcare internet interventions in low and middle income countries. In order to effectively address the second aim of this research replication of a quality systematic review was imperative.

While the Griffiths et al. (2010) systematic review covered the findings of RCTs measuring the efficacy of interventions for anxiety and depression prior to 2009, my research provides an updated review of this research and thus includes the research published between January 2010 and January 2016. This thesis not only looks at whether or not internet-intervention for depression and/or anxiety disorders are effective, but at possible reasons for their efficacy. In order to more fully understand the factors that led to effective and ineffective internet-interventions, of the reviewed studies, I performed a moderate number of statistical analyses. The factors/themes that were statistically analysed became salient through thematic examination (through NVivo 11, and categorisation of the included studies in table form; Appendices A, B and C). These analyses looked at the statistical significance of salient themes in creating an effective internet-intervention for depression and/or anxiety disorders. These themes and their analyses are described in detail below, in section 5.3.3 Data Analysis Method.

Furthermore, in addition to providing an updated review of the efficacy of internet-based interventions for anxiety and depression, the second aim of my research examines the limitations of the applicability of this research in the South African context. I believe that it is important to do this because although internet-based interventions have the potential to make psychological treatment for anxiety and depression more accessible there are features of these interventions (such as language medium and data costs) that have implications for their feasibility in the South African context. In this the salient themes (some of which were statistically analysed) of the included studies proved invaluable for comparison against the South African context. To answer the second aim of this thesis, this review has noted the themes that appear to affect efficacy from the included studies and assessed whether or not they may be effective in the South African context, through thematic analysis of similar and differing characterises. This comparison resulted in the creation of a check list of factors that could be used when designing a depression and/or anxiety Internet-intervention for South Africa. This list of factors can be seen as a first step in designing an appropriate Internet-intervention for South Africa. Improvements to it would come through increased research in

mental health Internet-interventions in South Africa. The efficacy of this list of factors would require testing through a study, which is beyond the scope of this Master's thesis, and could be an endeavour for future research.

Public health is moving toward the goal of implementing evidence-based interventions and to accomplish this there is a need not only to identify and select effective interventions but also to consider where they might need to be adapted. Adaptation focuses on changing intervention contents or procedures to be appropriate in a new situation. It is important to properly identify the sorts of modifications that are required to accommodate the context and requirements of a different population. A first step in this regard is to gather information about the characteristics of current internet-based interventions for anxiety and depression that have a bearing on their feasibility for implementation in South Africa. While reading the results of the systematic review conducted by Griffiths et al. (2010) I identified a number of demographics of the internet-based interventions included in the review that indicated limited generalizability to the South African context. For example: (1) only one of the trials measured intervention outcomes among rural populations; (2) therapist involvement was an aspect of all of the trial designs, with a median of 155 minutes; (3) most of the samples involved adults with a mean age in the range of 30-50 years. These demographics do not reflect the South African context where there is an urgent need to provide mental healthcare in historically under-served rural populations, where there are fewer clinical and counselling psychologists to population density ratio available to provide therapist involvement, and where the majority of the population are in their youth.

Thus, this systematic review takes into account that the majority of studies on mental health internet-interventions are conducted in locations with differing social and economic contexts than South Africa. It is certainly true that a review of studies that have similar characteristics to South Africa's context would allow for a more accurate comparison of their effectiveness to the South African context. Unfortunately, what the Griffiths et al. (2010) review shows, and indeed this review will show, is that remarkably little to no quality research is being published on internet-interventions for depression and/or anxiety disorders in low income counties. Therefore, to answer the second aim of this thesis, this review has noted the themes that appear to affect efficacy from the included studies and assessed whether or not they may be effective in the South African context. It is hoped that this review will show the lack of

research on mental health internet-interventions being done in low income countries, and inspire such valuable research to be undertaken.

### 5.3 RESEARCH DESIGN

A systematic review is an appropriate research design for the first aim of this research as it updates a pre-existing systematic review; Griffiths et al. (2010). A systematic review is a type of literature review that involves systematically collecting and analysing specific characteristics of multiple studies (Gough et al., 2012). Upon assessing the methodology of the Griffiths et al. (2010) review, although not explicitly stated, its methodology format highly resembles that of the PRISMA format for systematic reviews; as can be compared with the PRISMA checklist (Moher, Liberati, Tetzlaff, Altman, The PRISMA Group, 2009). This strong conformation to PRISMA format can be seen in their setting of inclusion and exclusion criteria, and setting word search limits before data collection. They disclose all sources of their data collection, and describe the process of data extraction from the studies. They assess risk of study bias, and state summary measures clearly. The reason PRISMA may not have been more directly used by Griffiths et al. (2010) is the timeframe of the Moher et al. (2009) publication. Publication of Moher et al. (2009) would have occurred after Griffiths et al. (2010) research had already begun. As this review duplicates the Griffiths et al. (2010) methodology it can be seen to also closely conform to the PRISMA format for undertaking systematic reviews.

In addition to the systematic review, a brief meta-analysis was done. The meta-analysis was conducted in order to give statistical support to themes drawn from the systematic review. It is not uncommon in psychological research to include a meta-analysis with a systematic review (Bailey & Leon, 2019; Bisson et al., 2007; Facer-Irwin et al., 2019; Groth et al., 2019; Mansueto et al. 2019; van Aert, Wicherts & van Assen, 2019). In this way researchers are able to assess the ability of themes to create an effect not only qualitatively but quantitatively as well.

This review is done with an outlook to summarizing the results of these studies and other key features that are of interest and to address the first aim of this thesis. Key features (study and participant characteristics and how they affect effect size, as well as ethical issues) of the

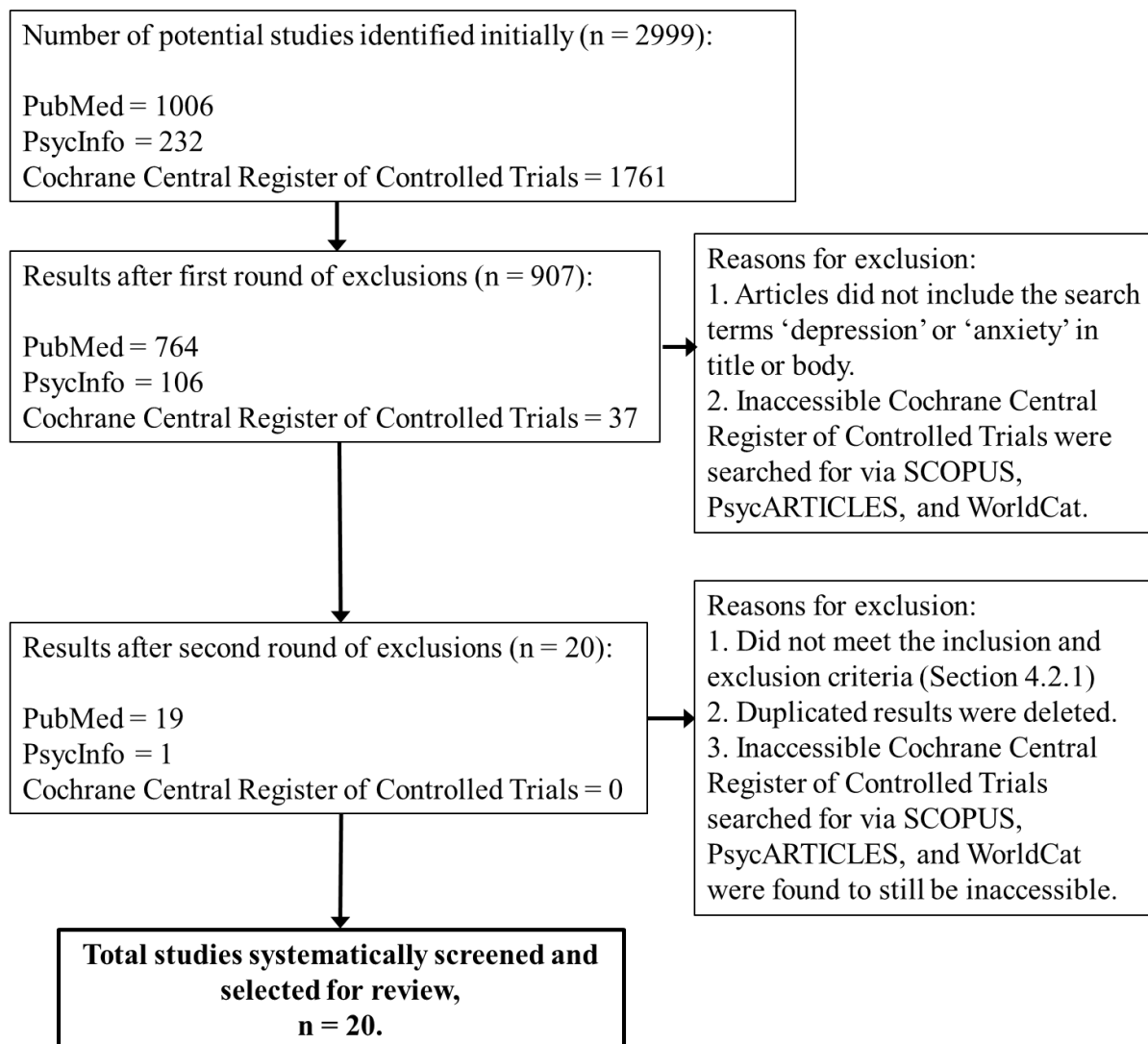
studies included in the systematic review were examined after thematically drawing them out in order to ascertain possible challenges for implementation in the South Africans context to address the second aim of this thesis. The two key features (therapeutic input and attrition rate) that were believed to most greatly influence efficacy were then exposed to brief statistical analyses in order to better gauge to magnitude of their influence on efficacy. This section contains information on how the research design was put into action in data sampling, data collection, and data analysis.

### 5.3.1 SAMPLING STRATEGY

Predefined inclusion and exclusion criteria are an important consideration in systematic reviews. As this research replicates an earlier study by Griffiths et al. (2010), I have employed the same selection criteria. These selection criteria that were set before commencing data collection were: (i) the research must report on one or more internet-based intervention (ii) the internet-based intervention(s) must be targeted for the treatment of either depression or anxiety or both, (iii) the effect size must be reported, or enough information provided to calculate it (this in order to determine efficacy), (iv) a measure of symptoms outcome for the targeted condition (anxiety, depression) must be reported, (v) the research must take the form of a Randomised Controlled Trial (RCT), (vi) the research must include a control group that received no active intervention, (vii) the research must be published and peer-reviewed (Griffiths et al., 2010, p. S4). In addition to Griffiths' criteria, (viii) the research must have been published between January 2010 (since Griffith et al. 2010) and January 2016 (up to the commencement of the current study). Studies were excluded if they did not meet the inclusion criteria.

### 5.3.2 DATA COLLECTION METHOD

Figure 1: Flowchart of the selection process



Collection of potential studies was carried out using the same online databases used by Griffiths et al. (2010). As the above flowchart indicates these databases were PubMed and PsycINFO, and Cochrane Central Register of Controlled Trials. The search terms used by Griffiths et al. (2010) were also employed. These were: “internet” OR “Web”. Once all of these studies were identified, I looked within this pool for studies that also had “Depression” OR “Anxiety”. The search terms depression and anxiety were not included in the first round of sampling as this would have resulted in the inclusion of a large number of studies that were not internet-based. It seemed prudent, therefore, to begin with the limiters ‘internet’ and ‘web’. I then excluded all of those studies that fell outside of my sampling timeframe (i.e. before January 2010 or after January 2016), inclusion criteria (e.g. did not include a control group, Habibović et al. (2014) and Donker et al. (2013) for example), and duplicate results. These exclusions meant that while I initially obtained 1006 results from PubMed and 232 results from PsycInfo. The final tally (i.e. only those meeting the inclusion criteria) was 19 results accessed via PubMed and one result from PsycInfo. This gives a total of 20 studies included in this review.

Adhering to the Griffiths et al. (2010) methodology (which this thesis replicates) in regard to the Cochrane Central Register of Controlled Trials database proved to be an insurmountable challenge. In the first instance this is because the Rhodes University library does not subscribe to this database. Secondly, while I was able to search through the Cochrane Central Register of Controlled Trials (where I identified 1761 articles that met my initial sampling criteria – i.e. with titles containing the search terms ‘internet’ or ‘web’) I discovered that the Cochrane Central Register of Controlled Trials does not provide access to any full text articles. I then attempted to access the full text articles via databases that the Rhodes University library subscribes to. I traced a small percentage of these articles (n=37, 2%) on other databases (SCOPUS, PsycARTICLES, and WorldCat) only to discover that I was still unable to access their full text. A list of these articles is provided in Appendix D. A list of all the studies included in my research is listed in Appendix A.

### 5.3.3 DATA ANALYSIS METHOD

An understanding of the systematic review being replicated is necessary in relation to data analyses. The Griffiths et al. (2010) systematic review consists of studies employing different

RCT designs and methods of implementation which complicates the calculation of effect size. However, Griffiths et al. (2010) do report having calculated effect size differences as well as comparing them across studies, however tentative the results (Cuijpers, Donker, van Straten, Li, & Andersson, 2010; van't Hof, Cuijpers, & Stein, 2009). I identified a number of other systematic reviews that produced valid, albeit limited meta-analyses of effect size (e.g. Coull, & Morris, 2011; Cuijpers et al., 2010; van't Hof et al., 2009). My systematic review presents a limited meta-analyses of effect size in relation to variables such as attrition and the inclusion/exclusion of therapeutic input.

While observations regarding effect size is an important aim of my research I consider the second aim that focuses on feasibility of design characteristics and methodology for the South African context to be an important new contribution to this field of study.

All of the trials included in my systematic review are tabulated in Appendix A along with their effect sizes. The effect sizes were recorded for observation. Efficacy, indicated by the inferential statistic of effect size of the selected studies is an integral component of the proposed research as this will show the degree to which the internet-based intervention (the independent variable) is effective on symptoms of depression and anxiety (the dependant variables) (Jackson, 2009). Effect size was calculated with Cohen's d statistic and can be classified as follows: 0.20 = small, 0.50 = medium, 0.80 = large (Jackson, 2009).

Where necessary, Cohen's d was calculated from data declared in the original studies, for example Cuijpers et al. (2012) and Christensen et al. (2014). Such studies that did not make use of Cohen's d to show effect size were indeed focused on the efficacy of their interventions but made use of statistical measures other than that of Cohen's d. In order to compare effect sizes across the included studies measures had to be converted to one type of statistical measure. I made use of the measure that was most in use in the included studies, Cohen's d. This was done in order to allow for a larger collection of studies to review. Cohen's d calculations were done in the following manner:

*Equation 1: Cohen's d*

$$d = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}}$$



Where,  $\bar{x}_1$  is the mean of Group 1;  $\bar{x}_2$  is the mean of Group 2;  $n_1$  is the number of patients in Group 1;  $n_2$  is the number of patients in Group 2; and  $s_1^2$  and  $s_2^2$  are the variances calculated as in Equation 2:

*Equation 2: Variance*

$$s_1^2 = \frac{1}{n_1 - 1} \sum_{i=1}^{n_1} (x_{i,1} - \bar{x}_1)^2$$

The variance is equivalent to the square of the standard deviation of the population's measured distribution, as is demonstrated in Equation 3.

*Equation 3: Standard Deviation*

$$\text{Standard deviation of } s_1 = \sqrt{\frac{1}{n_1 - 1} \sum_{i=1}^{n_1} (x_{i,1} - \bar{x}_1)^2}$$

Where cited reports did not publish the effects size using Cohen's d, but still provided sufficient data to calculate the effect sizes (i.e. means of scores of depression index tests; standard deviations of these scores; size of test groups) between tested groups and control groups, the above equations were used to estimate effect size and overall efficacy of intervention, relative to the control groups.

In addition to observing the effect size, there are features of the interventions that have been thematically drawn out in order to assess their ability to alter the efficacy of internet-interventions. Firstly information from the included studies was summarised using the same format as that of Griffiths et al. (2010) for the sake of congruency, as this systematic review is a follow-up of their systematic review; see Appendix A. This summarised data, along with additional valuable data from the included studies is presented and simultaneously discussed in Chapter 6, Results and Discussion. The additional summarised data can be more easily viewed in Appendices B and C. These appendices include sample characteristics of the included studies (e.g. previous treatment, education level), the costs of the internet based treatment (e.g. no cost, low cost), whether or not there was a face-to-face (i.e. contact) component to the intervention, and cross-cultural validity.

Appendix C was created in order to display and analyse data related to the ethical considerations reported in the original trials more clearly. Appendix C includes information on funding/sponsor conflicts of interest, whether clear eligibility criteria was given, ethical approval given by governing bodies, and attrition rates. Attrition rates were calculated for all groups of all interventions in order to show differences between treatment and control groups.

The attrition rates were calculated by simply dividing the number of Remaining Participants (RP) from the original number of participants (n) that existed after randomisation. This is then multiplied by 100 to give the retention rate, which is then subtracted from 100 to give the attrition rate. From example, if RP=22 and n=25 then:

*Equation 4: Attrition Rate*

$$\begin{aligned} 22/25 &= 0.88 \\ 0.88 \times 100 &= 88 \\ 100 - 88 &= 12 \\ 12\% &\text{ attrition rate} \end{aligned}$$

Inductive thematic analysis of this summarised information was also conducted with the use of software programme NVivo 11, and through categorisation of the included studies in table form (Appendices A, B and C). Coding focused on features of the included studies that were reported to be present during highly effective interventions, and those present in statistically ineffective interventions. These features were the focus in order to ascertain whether or not they affected effect size and therefore the efficacy of the internet intervention. Prevalent themes that emerged were: (1.) Type of mental health therapy. (2.) Length of the intervention. (3.) Therapist input. (4.) Attrition rate. A couple of these themes were then statistically tested, if appropriate to do so, to assess statistical significance in affecting efficacy. Those themes statistically tested were, therapist input and attrition rate, both in relation to effect size.

The statistical analyses were conducted as follows using the software programme Statistica. Analysis on attrition rate means was conducted between the treatment/experimental and control groups using Kolmogorov-Smirnov two-tailed test, as it is a non-parametric test and is used to compare distributions of two data sets (de Muth, 2014). This was done to ascertain if there was a difference between treatment and control groups across the three targeted conditions: depression, anxiety, and depression and anxiety. Analysis was then conducted to ascertain if one particular treatment condition had a statistically higher attrition rate. This was done by using post-test data on the Kruskal-Wallis ANOVA. Kruskal-Wallis ANOVA was

chosen for this task as it is a non-parametric test that compares independent samples (de Muth, 2014; StatisticsSolutions, 2018).

As the literature had indicated an interest in the inclusion of therapist input in studies of internet-based interventions for depression and anxiety disorders I ran analysis on whether or not including therapist input had an effect on effect sizes. This analysis formed part of answering the second aim of this thesis, through developing a foundation for understanding the possibilities and limitations in a South African context. Understanding what variables affect effect size allows one to then assess that variable's play in South Africa. Using information I had tabulated in Appendix A I identified those studies that reported having any therapist input; usually referred to as 'guided'. Level of therapeutic was not assessed as data was heterogeneous in that regard. I again made use of Kolmogorov-Smirnov two-tailed test to ascertain if there was a significant difference in effect sizes between studies that included therapist input and those that did not. Within effect sizes of control groups were not used. In order to maintain validity, I used only the outcome measures from the Intention to Treat (ITT) analysis data, as it was the largest group of data. Completers Only (CO) analysis was not included as it would be a repetition of data points. In addition, for internal validity, I did not include effect sizes that were measured across targeted conditions. For example, if a depression targeted intervention reported depression ESDs and anxiety ESDs I included only the depression ESDs.

I then completed the same process again but according to the pre-grouped studies. Previously, in Appendix A studies were grouped into three groups according to whether they targeted depression or anxiety, or depression and anxiety simultaneously, for congruency with the methodology of Griffiths et al. (2010). The effect of therapist input was tested for each of these three groups using Kolmogorov-Smirnov two-tailed test, in order to reveal if any group had no significant difference in therapist input.

In answering the second aim of this thesis (possibilities and limitations of feasibility of such internet-intervention in a South African context) results of statistical analysis are reported and themes were drawn from these results and compared to the needs and context of South Africans, this is discussed in detail in Chapter 6. This was done because the reviewed studies were developed and conducted in high income countries whose contexts differ from South Africa which is considered a low income nation. From this comparison between the reviewed studies and the context of South Africa's people it became possible to put together a list of

factors, or checklist, of aspects that should be considered when designing any South African internet-intervention for depression and/or anxiety interventions. This list of factors takes into account the themes (such as therapist input) that lead to highly effective internet-interventions and aligns them with South Africa's context. By South Africa's 'context' I am referring to those characteristics that differentiate South Africa. Characteristics such as unemployment, level of education, and use of language, and others that have been described in section 4.4.

## 5.4 LIMITATIONS

The inability to include all potential studies into this systematic review is a limitation to analysis. Institutional access to the Cochrane Central Register of Controlled Trials was limited at the time of data collection. However, it is unlikely that accessing these 37 articles (Appendix D) would have resulted in many more studies included in my final data corpus. For example, of the 1238 studies that I could access, only 20 (1.6%) of these studies (1.6%) met my inclusion criteria. Only 20 relevant studies that fulfilled the inclusion criteria. It is impossible to know for certain statistically as those 37 missing articles may have been a cluster of relevant studies. Although more studies would have benefited this review, in moving forward 20 studies is sufficient to draw thematic and basic statistical conclusions from. Griffiths et al. (2010) were themselves limited by a small sample size of 29 studies that satisfied the inclusion criteria.

The systematic review that this research's methodology is based on did not include unpublished studies, in order to heighten the quality of their included studies (Griffiths et al., 2010). This research also did not include unpublished studies and acknowledges that publication bias could therefore be a possible factor and limitation. Publication bias can occur when studies are not published due to not having found significant results (van Aert et al., 2019). These non-significant results would not be included in meta-analyses, which could alter their conclusions.

## 5.5 RELIABILITY AND VALIDITY

Accurate outcomes and conclusions of systematic reviews are in part dependent upon the quality of the original research that is included in the review (Gough et al., 2012). Reliability refers to the ability of a trial to reproduce its results consistently (Jackson, 2009) while external validity refers to the ability of a trial to achieve results that are generalizable to the broader population and internal validity refers to how well an experiment avoids confounding variables (Jackson, 2009). The differences between cultures can be seen as confounding variable affecting internal validity in research. Cross-cultural validity is an attempt to resolve any culture related confounding variables that may cause inaccuracy in results (Jackson, 2009).

Since this thesis is concerned with the future development of internet-based interventions for depression and anxiety disorders for use in South Africa – a multicultural nation – cross-cultural validity was observed and reported on where possible.

In a similar fashion to the above, meta-analyses are dependent on accurate information given by their original studies (van Aert et al., 2019). If studies are not published simply because they did not produce significant results they leave a ‘gap’ in the academic knowledge pool. This means that when meta-analyses are conducted that information is not included. This can lead to effect sizes and even variables possibly being misrepresented as larger or as more important than they actually are (van Aert et al., 2019). This is referred to as publication bias, which is a limitation to the validity of studies. This bias can be eased, but not necessarily wholly corrected, by including unpublished studies. The systematic review that this research’s methodology is based on did not include unpublished studies, in order to heighten the quality of their included studies (Griffiths et al. 2010). This research also did not include unpublished studies and publication bias could therefore be a possible factor and limitation.

## 5.6 ETHICS

Although ethical concerns that would usually affect an original trial, such as harm to participants, do not occur in systematic reviews as those original studies have been previously completed, a few ethical considerations remain and were considered in the methodology of this systematic review. Systematic reviews are positioned to draw attention to the successes

or failings of their included studies that could impact outcomes in their area of discipline (Gough et al., 2012). Therefore, there are ethical responsibilities that authors of systematic reviews should take up in order to analyse and draw conclusions that are accurate and enlightening. Elia, von Elm, Chatagner, Pöpping, and Tramè (2016) argue that researchers undertaking systematic review research should take steps to reduce any potentially negative impacts of the studies included in their systematic reviews. For example, factors that should be reduced are: publication bias (excluding unpublished trials in systematic reviews), selective reporting within original trials, conflicts of interest of funders or authors of original trials, ethical approval of original trials by a governing body (Elia et al., 2016).

I am limited in my ability to address all of these factors as I am replicating the systematic review methodology of Griffiths et al. (2010). Therefore, I could not include unpublished trials that would have aided in the control of publication bias, and although this might leave out an unknown number of reliable and valid trials. A likely factor in strengthening reliability and validity in systematic reviews is included, peer-reviewed trials, and this is more likely to occur through publication (Gough et al., 2012). The importance of peer-review should not be underestimated in its value to quality control of trials, and such peer-reviewed trials could be seen as strengthening systematic reviews in having been accessed for quality once before already, albeit of uncertain origins and degree (Roberts & Shambrook, 2012).

Factors that were under the control of this researcher to ascertain were: noting any conflicts of interest of the trials as reported in the published articles as well as noting statements regarding ethical approval of the research – which is increasingly becoming a criterion for publication. It can even be argued that ethical review and approval is a mechanism for quality control of the research design and methodology and thus affording greater oversight of reliability and validity in the design phase of the research.

A more implicit ethical concern is that of cross-cultural validity in relation to developing internet-based interventions for multi-cultural South Africa. To begin to address this the validity and effect sizes of any cross-cultural trials have been reported on in 6.2.5. In addition, a basic list of factors for South African internet-based interventions for depression and anxiety disorders was formulated from information from Appendices A, B, and C, and the literature review; this can be found in 6.7.

## 5.7 CHAPTER CONCLUSIONS

This chapter showed that the aims of this research were drawn from needs illuminated by the surrounding literature. Namely, the need to broaden the knowledge base of mental health internet interventions in general, and secondly to assist South Africa and its people in sourcing effective methods in alleviating the mental healthcare burden.

Research design was detailed, showing how this systematic review was conducted, and how conclusions were made concerning the feasibility of implementing internet interventions in South Africa. Limitations, reliability and validity, and ethical considerations were also covered.

The following chapter presents the results of the systematic review, the main themes that emerged from those results in regards to efficacy, and the implications of these results and main themes for implementation of internet interventions for South Africa in the form of a list of noteworthy factors in intervention development.

## **CHAPTER 6: RESULTS AND DISCUSSION**

### **6.1 CHAPTER OVERVIEW**

To reiterate the aims of this research, this thesis sought to provide an updated systematic review of the efficacy of internet-based interventions for depression and anxiety disorders initially conducted by Griffiths et al. (2010). Whether internet-interventions were effective or not was noted and, more importantly for addressing aim two, the possible reasons for them being or not being effective. It also sought to ascertain the possibilities and limitation of such interventions for use within the South African Context. Twenty (n=20) studies meeting the inclusion criteria were included in this review. Data from within these studies was submitted to statistical and thematic analysis. This section concerns the results and discussion of the analysis and their implications within the context of the surrounding literature.

In order to fulfil the first aim of this thesis I have grouped my results into four broad areas: (I) Effect Size; (II) Study Characteristics; (III) Sample Characteristics; (IV) Ethics Considerations. Each of these areas is addressed in turn in the sub-sections below. From these areas main themes in regards to effect size were drawn; section 6.6. Discussion includes the possibilities and limitation of internet-based interventions for depression and anxiety within South Africa in the form of a list of factors that should how implementation could be feasibly, , in order to fulfil the second aim of this thesis.

### **6.2 EFFECT SIZE**

As effect size was essential to completing aim one of this thesis. The results are broken down in detail in the sections to follow. To clarify, the first aim of this thesis was the systematic review of the efficacy of internet-based interventions for depression and anxiety disorders. Efficacy is indicated through effect size.



### 6.2.1 EFFECT SIZE AT POST-TEST AND FOLLOW-UP

A tabulation of Effect Size Differences (ESD) can be viewed in Appendix A. The ESD results indicate that n=15 (75%) of the studies reported efficacy at post-test, with ESDs above 0.20. Four (n=4, 20%) of the studies had ESDs below 0.20, meaning that they were essentially ineffective (Boettcher et al., 2012; Carlbring et al., 2012; Hoek et al., 2012; van Ballegooijen et al., 2013). Unlu Ince et al. (2013), produced a high effect size post-test in their per-protocol analysis (depression:  $d = 1.68$ , anxiety:  $d = 1.48$ ) but considered their study to be ineffective due to a low p value. Unlu Ince et al. (2013) did not reach the sample size they had intended, and they believe this is the reason for the low p value. However, the results of their intention-to-treat analysis, which would have included all participant results since randomisation were not high but medium to low; depression:  $d = 0.37$ , anxiety:  $d = 0.25$  (Unlu Ince et al., 2013). Table 1 provides a summary of the number of trials with an overall effect score above 0.20 and those below 0.20.

*Table 1: Effect Size at Post-Test*

<b>Efficacy</b>	<b>Number of Trials</b>
Effect Sizes above 0.20	15
Effect Sizes below 0.20	5

While all studies completed assessments post-intervention (post-test) to establish efficacy, fifteen of them also completed a follow-up assessment, ten of which reported sustained efficacy (Berger et al., 2011; Berger, Boettcher, & Caspar, 2014; Broiler et al., 2013; Christensen et al., 2014; Hedman et al., 2011; Hoifodt et al., 2013; Paxling et al., 2011; Proudfoot et al., 2013; Strom et al., 2013; Tillfors et al., 2011; Unlu Ince et al., 2013). Initial follow-up assessments were held from three months to one year later, with a median of six months. Three studies completed a second follow-up, all of which remained effective (Christensen et al., 2014; Hedman et al., 2011; Paxling et al., 2011). The longest period between post-test and follow-up was five years and was assessed as still being effective (Hedman et al., 2011). Table 2 is a summary of the number of trials with either one or two follow-ups and reported efficacies.

*Table 2: Efficacy at Follow-Up*

<b>Follow-Up</b>	<b>Number of Trials:</b>	<b>Efficacy Sustained:</b>
First Follow-Up	15	Yes = 10; No = 5
Second Follow-Up	3	Yes = 3

Six studies (n=6) reported high effect sizes (0.80 and above) on a range of measures as well as sustained efficacy at follow-up (Berger et al., 2011; Berger et al., 2014; Hedman et al., 2011; Hoifodt et al., 2013; Paxling et al. 2011; Tillfors et al., 2011). These six studies reported having both ‘therapist input’ and ‘patient reminders’, as well as an intervention length of at least eight weeks – apart from Hoifodt et al., (2013) who reported six weeks intervention time. In addition, the six all reported CBT as their treatment modality. Table 3 (below) provides a summary of the trials with effects sizes over 0.80, their treatment method, duration of treatment and whether or not therapeutic feedback or patient reminders was a feature of the intervention.

*Table 3: Characteristics of Trials with Effect Sizes Above 0.80*

<b>Trials with Effect Sizes over 0.80</b>	<b>Treatment Approach</b>	<b>Duration</b>	<b>Therapeutic Feedback, and Reminders</b>
Berger et al., 2011	CBT	10 Weeks	Yes, Yes
Berger et al., 2014	CBT	8 Weeks	Yes, Yes
Hedman et al., 2011	CBT	9 Weeks	Yes, Yes
Hoifodt et al., 2013	CBT	6 Weeks	Yes, Yes
Paxling et al. 2011	CBT	8 Weeks	Yes, Yes
Tillfors et al., 2011	CBT	9 Weeks	Yes, Yes

## 6.2.2 TRIALS TARGETING DEPRESSION

Seven (n=7) of the eight (n=8) depression targeted trials reported evidence of efficacy (i.e. Berger et al., 2011; Boiler et al., 2013; Carlbring et al., 2013; Hoifodt et al., 2013; Lintvedt et al., 2013; Strom et al., 2013; Vernmark et al., 2010). Four (n=4) of the trials were conducted

with at least some participants who were diagnosed with Major Depression (MD) (i.e. Berger et al., 2011; Carlbring et al., 2013; Hoifodt et al., 2013; Vernmark et al., 2010). The other four trials (n=4) had participants who were reported to have either mild, mild to moderate depression, or reported depressive symptoms, or did not declare level of depression (Boiler et al., 2013; Lintvedt et al., 2013; Strom et al., 2013; Unlu Ince et al., 2013). Four (n=4) of the effective trials employed CBT as their treatment (Berger et al., 2011; Hoifodt et al., 2013; Lintvedt et al., 2013; Vernmark et al., 2010). The other three effective trials employed positive psychology, behavioural activation (BA) that included acceptance and commitment therapy (ACT), and physical activity focus (Boiler et al., 2013; Carlbring et al., 2013; Strom et al., 2013). The single (n=1) statistically ineffective trial employed problem solving therapy (Unlu Ince et al., 2013). Table 4 is a summary of the number of effective and ineffective trials (targeting depression) according to treatment method.

*Table 4: Trials Targeting Depression*

<b>Level of Depression:</b>	<b>Number of Trials:</b>
Major Depression	4
Mild Depression	1
Mild to Moderate Depression	1
Symptoms of Depression	1
Undeclared	1

Most studies compared only one active group against a control group, but a few split their active group for comparisons against each other as well as a control group. Berger et al. (2011) compared therapist input to no therapist input. Both were found to be effective, but therapist input produced a higher efficacy at  $d=1.14$  over  $d=0.66$  (no therapist input). All eight depression targeted trials made use of a WLC, with one effective trial allowing TAU within their WLC. ESD results varied ranging from 0.08 to 1.14 across the overall effective trials, with most exceeding 0.50. Table 5 shows the ESD range and median across all depression targeted trials.

*Table 5: ESD Range Across Depression Targeted Trials*

ESD Range (Median):

### 6.2.3 TRIALS TARGETING ANXIETY

Of the nine (n=9) trials targeting anxiety disorders, six (n=6) were effective (Berger et al., 2014; Christensen et al., 2014; Hedman et al., 2011; Kok et al., 2014; Paxling et al., 2011; Tillfors et al., 2011). Table 6 show the number of effective trials in the anxiety targeted category. Targeted conditions overlapped in the studies with some studies targeting more than one anxiety disorder, allowing for results to show more than nine outcomes. Four (n=4) of the effective trials employed CBT, and were targeted at social phobia (Berger et al., 2014; Hedman et al., 2011; Paxling et al., 2011; Tillfors et al., 2011). Two (n=2) social anxiety disorders trials did not show evidence of efficacy and employed an attention training and cognitive bias modification treatment respectively (Boettcher et al., 2012; Carlbring et al., 2012). Two (n=2) trials targeted generalised anxiety and both were found to be effective and employed CBT – with one utilizing psychological education in addition to CBT (Christensen et al., 2014; Paxling et al., 2011). As Griffiths et al. 2010 alluded to in their review psychological education may be a beneficial addition in striving for efficacy. The one (n=1) (various) phobia targeted trial employed exposure therapy and was found to be effective (Kok et al., 2014). The one (n=1) trial for panic symptoms employed CBT but showed no evidence of being effective (van Ballegooijen et al., 2013).

*Table 6: Specific Anxiety Conditions Targeted*

<b>Targeted Condition</b>	<b>Number of Trials</b>	<b>Effective</b>
Social Phobia	4	Yes
Social Anxiety	2	No
Generalised Anxiety	2	Yes
(Various) Phobia	1	Yes
Panic Symptoms	1	No

The ESD results of the overall effective trials varied ranging from 0.02 to 1.48, with most exceeding 0.65. Table 7 shows the ESD range and median of trials across those targeted for anxiety.

*Table 7: Effect Size across All Anxiety Targeted Trials*

	Effect Size Range (Median):
Across All Anxiety Targeted Trials	0.02 – 1.48 (+0.65)

#### 6.2.4 TRIALS TARGETING DEPRESSION AND ANXIETY

Of the three (n=3) trials targeting both depression and anxiety two (n=2) showed evidence of efficacy (Kleiboer et al., 2015; Proudfoot et al., 2013). Problem solving therapy was employed in both a trial that showed insubstantial efficacy and one that did show efficacy (Hoek et al., 2012; Kleiboer et al., 2015). The former had a smaller sample group (45) than the latter (537) (Hoek et al., 2012). The latter’s ESD results were however low, with a median of approximately 0.24 (Kleiboer et al., 2015). The other effective trial, employing CBT, had a sample size of 720, and total treatment ESD result of 0.55 (Proudfoot et al., 2013). Table 8 shows the number of effective trials within the grouping of mixed anxiety and depression targeted groups.

*Table 8: Effect Size in Trials Targeting Both Depression & Anxiety*

	Effect Size Range (Median):
Across All Mixed Depression & Anxiety Targeted Trials	0.01 – 0.62 (+0.22)

#### 6.2.5 CROSS-CULTURAL TRIALS, EFFICACY AND VALIDITY

Only one study reported intention of cross-cultural use of its treatment programme (Unlu Ince et al., 2013). Adaptation from the already successful Netherlands programme *Alles Onder Controle* (AOC) (everything under control) was completed to allow for a culturally sensitive alternative for use by Netherlands Turkish migrants who suffer from depression (Unlu Ince et

al., 2013). AOC had a medium effect size of  $d=0.50$  (Unlu Ince et al., 2013). The adapted version had a high internal consistency with Cronbach alpha = 0.87 at baseline and was assessed for cost-effectiveness through which it appeared cost-affective (Unlu Ince et al., 2013). Although they declared their trial to be unsuccessful due to low statistical significance the post-test effect size achieved was large at  $d = 1.68$  and again at follow-up four months later;  $d=1.13$  (completers-only analysis). They indicated that the low significant difference between the groups was due to not meeting their pre-set requirements of a large enough sample size to reach their goal of power reaching 0.80 (Unlu Ince et al., 2013). Their attrition rate was high at 42% (40/96) post-test, and any reason for this could not be unaccounted for by the researchers (Unlu Ince et al., 2013).

Berger et al. (2014), a study targeting anxiety, recruited participants across three countries; Switzerland, Germany, and Austria. However, they make no mention of cross-cultural adaptation or the cross-cultural validity of their intervention (Berger et al., 2014). However, cross-cultural implications do not seem to have hindered the efficacy of their intervention as they achieved effect sizes over 0.80 (Berger et al., 2014).

### 6.2.9 SIMILARITIES ACROSS REVIEWED STUDIES

From the above results it was noted that higher efficacy was found in studies that share similar characteristics. Sample and study characteristics were looked at in more detail between the three long term effective studies in contrast to the five low efficacy studies. With an understanding that the sample size was small ( $n=20$ ), it still would appear that some study characteristics found across trials affected outcomes.

These salient similarities across the three long term effective interventions were: treatment method (CBT), duration of treatment (8-9 weeks), type of control group (WLC), included therapist input, use of intention to treat analysis (ITT), follow-up at least a year after intervention (Appendix A). They also shared low attrition rates between start of intervention and post-test; i.e. during the intervention, and were given clearance by an ethics committee – although Paxling et al. (2011, p.161) did not declare the name of the ethics committee rather stating, ‘local ethics committee’ (Appendix B). When one compares these similarities with the shared similarities of the five ineffective interventions a pattern emerges, a pattern that may show successful study characteristics for future use, at least for similar cohort samples.

This pattern is teased out and explored below, by juxtaposition of effective and ineffective studies.

As higher efficacy is found in studies that share similar characteristics, so a similar occurrence was found in those that were reported to be ineffective. In addition, these groupings of characteristics tend to be oppositional to the ones found in effective studies, which will be explored below. The exception to this is analysis and type of control group. Effective and ineffective interventions made use of intention to treat (ITT) analysis and waitlist control (WLC), both of which are considered good methodology practises (Jackson, 2009). As these study characteristics are shared between effective and ineffective interventions it is unlikely that they caused any significant difference in outcome between these trials. Unlike length of treatment, and this differed between interventions that were highly effective and ineffective.

This systematic review presents five studies that reported having low effect sizes, and therefore low efficacy (Boettcher et al., 2012; Carlbring et al., 2012; Hoek et al., 2012; Unlu Ince et al., 2013; van Ballegooijen et al., 2013). Of those five studies one targeted depression, three anxiety, and one targeted depression and anxiety. Although these studies produced low effect sizes three of them conducted follow-ups, which were also recorded as ineffectual (Boettcher et al., 2012; Carlbring et al., 2012; Unlu Ince et al., 2013). Conducting and reporting the findings of these follow-ups proves that there was no significant positive change in outcomes between the post-test and follow-up, as one would expect.

These five studies share a number of characteristics that may have led to their low effect sizes at post-test. All interventions used treatment methods that were not cognitive behavioural therapy (CBT), or were based on CBT but possibly did not include all of its principles, such as problem-solving therapy (PS). In comparison the effective interventions used CBT. This may indicate why CBT is the most widely used method of treatment; it may simply be more effective in the sphere of internet-based therapy than other treatment options.

Through the information given by Porto et al. (2009), neurologically it would seem likely that the process of CBT contributed to changes in thought patterns, changing which areas of the brain were activated. Change of active brain areas means changed use of neural pathways in the participants of these studies. This means that instead of areas of the brain associated with fear being activated CBT vicariously teaches people with anxiety to instead activate areas

responsible for emotional regulation and the like through the process of understanding their thoughts and altering negative/damaging thought patterns. Shou et al. (2017) believe it is the areas responsible for cognitive control that are activated through the process of CBT. The CBT process would need to be slightly different for people who have a depressive disorder because, as Clark and Watson (1991) informs, fear is absent in depression and therefore there would be no need to attempt to 'deactivate' areas of the brain responsible for fear, although similar ones (emotional regulation) could be encouraged to activate. This means that it is indeed best (ideal) to have separate interventions that target depression or anxiety disorders unless the person presents with symptoms of both; as is seen in the range of studies of this review (n=8 depression, n=9 anxiety, n=3 depression and anxiety). However, the treatment method of CBT remains effective for both depression and anxiety disorders, simply needing focus either on one or the other condition.

If the use of CBT then strengthens these newly formed neural pathways to the point where they remain long term, then one can begin to see how it is possible for highly effective CBT studies to have long lasting results. The study conducted by Shou et al. (2017) with participants with Major Depressive Disorder (MDD) and Post Traumatic Stress Disorder (PTSD) shows that CBT physically strengthened a neural pathway from the amygdala to areas responsible for cognitive control, increasing capability to regulate emotions. Length of time of intervention with therapist input may also be a factor, in that exposure time would allow thought patterns to become habit and behavioural changes, which would strengthen neural pathways. This review found treatments with longer duration (6 weeks plus) were more efficacious than those with shorter intervention periods (below 6 weeks) (Table 33). CBT is not the only study characteristic to possibly allow for greater effect size. This review also found a statistically significant difference in the use of therapist input in interventions in favour of therapist input for higher efficacy. This finding is consistent with that of Griffiths et al. (2010) and is explored in the section below.

### 6.2.10 EFFICACY

At the outset of this thesis the focus was on the efficacy of internet-based interventions for depression and anxiety disorders, in order to fulfil the first aim. Literature indicated that such internet-based interventions are predominately at least as effective as similar face-to-face



interventions (Griffiths et al., 2010). This study came to the same conclusion, with the majority of effect sizes being at least as large, and at times larger, than a standard psychological treatment (0.31 in primary care) as reported by a meta-analysis (Titov et al., 2009). In addition, effect sizes of the depression targeted trials were as large as the treatment of depression with antidepressant medication (0.37) (Robinson et al., 2010). Efficacies of the included interventions were given by the studies or were calculated by myself using the Cohen's *d* formula. From the results there were three studies that stood out from the other 18 in terms of efficacy. These three studies were: Hedman et al (2011), Paxling et al. (2011) and Tillfors et al. (2011). The reason for salience was two-fold. These studies had effect sizes ranging over 0.80. Secondly these studies reported holding efficacy at follow-up at least one year after their interventions. They could therefore be considered highly effective interventions. Hedman et al. (2011) was a five year follow-up study and Paxling et al. (2011) held a three year follow-up. Tillfors et al. (2011) who reported effect size results well over 0.80 conducted a follow-up one year after post-test. Three other studies show much the same promise but had a shorter period (six months) between post-test and follow-up (Berger et al., 2011; Berger et al., 2014; Hoifodt et al., 2013). The length of time between post-test and follow-up of these trials would indicate a probability that these interventions could be effective for longer, however, proven long term efficacy is more valuable. This is important as long-term efficacy would not only be of personal benefit to the participants but practically speaking would mean lower cost and time spent on further treatments. Lower costs and time spent on treatments in South Africa would mean a release of pressure on our healthcare system. It would therefore be in South Africa's interest to implement interventions that have proven long term efficacy.

Long term efficacy of internet-based interventions has not always been of much concern in published studies. Griffiths et al. (2010) reported only three studies out of 26 trials that recorded any attempt of follow-up, the longest of which was 1 year. In comparison this review reports that 15 out of 20 studies recorded follow-up results in their published papers (Berger et al., 2011; Berger et al., 2014; Boettcher et al., 2012; Broiler et al., 2013; Carlbring et al., 2012; Carlbring et al., 2013; Christensen et al., 2014; Hoifodt et al., 2013; Hedman et al., 2011; Paxling et al., 2011; Proudfoot et al., 2013; Strom et al., 2013; Tillfors et al., 2011; Unlu Ince et al., 2013; Vernmark et al., 2010). This is a marked difference over a short number of years and it can be speculated that one of two things is happening that is resulting in improved studies. Either the importance of proving long term efficacy is being taken more

seriously, or a focus on reporting conducted follow-ups to prevent bias in publication is occurring, as Elia et al. (2016) writes about. It is possible that follow-ups are being reported more often, whether or not they show long term efficacy, is being caused by an academic focus on removing the effects of bias caused by selective reporting of outcomes. In which case we are seeing a positive outcome to such efforts, as systematic reviews can now have access to such information that will show which interventions are effective for longer. They can then go on to discuss why such interventions hold efficacy for longer and why others do not, for the population sample they were tested on.

### 6.3 STUDY CHARACTERISTICS

This section provides information pertaining to important study characteristics such as targeted conditions, therapeutic approach, duration of the intervention, and so on. For ease of reference a tabulated summary of the characteristics of all of the studies included in this research is provided in Appendix A (beginning on p. 156). This summary was developed in accordance with the format developed by Griffiths et al. (2010). I have replicated that format for ease of comparison. The tabulated summary includes study and sample characteristics that could potentially impact the effectiveness of the studies under review, such as the type of therapeutic approach informing the intervention and the duration of the intervention.

The studies are ordered according to the condition that they targeted: depression only, anxiety only, or both depression and anxiety. The outcome measures that informed the Effect Size Difference (ESD)/Effect size (ES) is tabulated in relation to each of the targeted conditions regardless of whether they were a primary or secondary outcome. For example, the Boiler et al. (2013) study targeted depression, but used the Centre for Epidemiologic Studies Depression Scale (CES-D) and the Hospital Anxiety and Depression Scale - Anxiety subscale (HADS-A) to measure both depression and anxiety. As Broiler et al. (2013) were targeting depression with their intervention their results are tabulated under 'Depression outcomes' in Appendix A even though they measured both depression and anxiety. This was done so that the connection between the targeted condition(s) of the intervention and their outcomes could be viewed more clearly.

### 6.3.1 TARGETED CONDITIONS

Twenty studies fulfilled the inclusion criteria (n=20). Of the 20 studies eight studies targeted depression while nine targeted anxiety disorders (panic symptoms, n=1; phobia, n=1; social anxiety disorder, n=5; generalised anxiety disorder, n=2). Three studies were aimed at both depression and anxiety disorders (Hoek et al., 2012; Kleiboer, Donker, Seekles, van Straten, Riper, & Cuijpers, 2015; Proudfoot et al., 2013). The Hedman et al. (2011) study is a five year follow-up assessment. Although the original intervention was conducted prior to 2010 (and thus prior to the inclusion date for this research) I have included it because the publication date of the journal article is within the inclusion parameters for this study and because of its value in analysing long-term treatment effectiveness. A summary table of the number of included studies grouped according to conditions targeted follows below in Table 9.

*Table 9: Targeted Conditions*

<b>Targeted Conditions</b>	<b>Number of Trials</b>
Depression	8
Anxiety	9
Depression and Anxiety	3

### 6.3.2 THERAPEUTIC APPROACH

Unlike the Griffiths et al. 2010 review, not all of the studies reviewed here employed CBT (or a component of CBT) as a treatment intervention (CBT, n=12; problem solving therapy, n=3; a physical activity focus, n=1; CBT and psychological education, n=1; cognitive bias modification, n=1; positive psychology, n=1; behavioural activation with acceptance and commitment therapy (ACT), n=1). Nevertheless, CBT remains the dominant therapeutic approach in internet-based interventions for anxiety and depression. A summary table of types and number of treatment approaches found to have been used is summarised in Table 10.

*Table 10: Therapeutic Approach*

<b>Therapeutic Approach</b>	<b>Number of Trials</b>
Cognitive Behavioural Therapy (CBT)	12
Problem Solving Therapy	3
Physical Activity Focus	1
CBT and Psychological Education	1
Cognitive Bias Modification	1
Positive Psychology	1
Behaviour 'Activation' with ACT	1

### 6.3.3 DURATION OF INTERVENTION

Programme durations ranged from four to 12 weeks, with a median of eight weeks; Table 16 summarises this information. This shows a slight lengthening of the minimum length of interventions as Griffith et al. (2010) noted the range of their studies to fall between one to 11 weeks.

*Table 11: Duration*

<b>Range</b>	<b>Median</b>
4-12 Weeks	8 Weeks

### 6.3.4 THERAPIST INPUT

Therapist input was reported in most studies (n=15, 75%). Seven (n=7) of the trials targeting depression, seven (n=7) of the interventions targeting anxiety, and one (n=1) of the trials targeting both depression and anxiety reported including therapist input in the form of contact via email or telephone. Only five (n=5) of the 15 studies that incorporated therapist input reported on the duration of that guidance. Of those studies reporting on the amount of time given over to therapist input the mean therapist input time per participant ranged from 25 minutes to 97 minutes over the duration of the intervention, Table 12 summarises this information.

*Table 12: Therapist Input*

**Range of Mean Therapist Time per Participant (Rough):**

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25-97 Minutes

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I observed that therapist input was also not always considered to be of a therapeutic nature. Hoek et al., (2012), for example, said that they provided feedback to participants about completion of exercises but state that this feedback was not therapeutic in nature and they do not identify therapist input as a characteristic of their intervention design.

### 6.3.5 THE QUESTION OF OPTIMAL LEVELS OF THERAPIST INPUT

Although this review found that therapist input does make a statistical difference in the efficacy of these interventions, it was unable to further calculate an optimal level of therapist input. This was due to the relevant information from reviewed studies being limited and heterogeneous. An optimal level of therapist input would allow treatment interventions to heighten or hold high efficacy by allowing therapists to allocate their time most effectively. An optimal level might hypothetically indicate that therapists can effectively spend less time on interaction and therefore that less therapist time is needed, lessening the expense of the intervention.

Given that research has been conducted for a number of years now in order to answer the question of how much therapist input would be optimal, perhaps the number of years does not reflect the amount of data collected; Griffiths et al. (2010) noted the need to ascertain an optimal level of therapist input. The optimal level of therapist input is not as easy to ascertain as whether guided or unguided internet-based interventions are more effective; the design of which has two main variables, guided and unguided. Optimal level denotes a time scale that must be checked at differing levels, and in accordance with type of delivery method. For example, a study could measure its treatment against differing amounts of therapist time of that treatment but would also need to take into account the type of communication method. By communication method I mean that different methods of interaction may hold higher quality for efficacy; for example, a video-chat might be more effective than an email. Therefore, the design of study that wished to test for the optimal level of therapist input could

include a scale of time/amount of input and juxtapose it with an array of types of communication methods, such as email and video-chatting.

A systematic review could possibly accomplish calculating an optimal level of therapist input as such reviews can collate and compare greater amounts of data. However, systematic reviews cannot analyse data that are not reported in the original studies. This occurred in this current review, as only a few studies reported the duration or amount of time a therapist spent interacting with participants (Appendix A). A rough range of time was gleaned from the five studies that did give such information; 25 – 97 minutes. This range is wide and does not give a clear indication of what an optimal level of therapist input could be. This would support my claim that such data collected through these studies does not reflect the years spent on research.

I would like to encourage researchers of such studies to record and publish the amount of time their therapists interact with participants, per participant, preferably per week, for the sake of comparison between studies. Uniformity of recordings is beneficial in comparing studies with more accuracy, as it creates homogeneity. Obviously, uniformity across studies is not always possible as at times research designs differ. Perhaps therapist input differs from week to week and therefore would need to be recorded as an average for the whole intervention. Reporting input per week would allow for more accurate comparison across studies that differ in duration. Unfortunately, unit measure may also vary. For example, Berger et al. (2014) sent messages while Paxling et al. (2011) reported therapist interaction time to be mainly focused on guidance through the internet-based intervention. If possible, a unit measure of time spent per participant would be preferable. I believe reporting time per participant is the closest we have to a norm in this area, more so than averages of messages (Carlbring et al., 2013; Griffiths et al. 2010; Kleiboer et al., 2015; Paxling et al., 2011).

More thorough reporting is therefore needed to ascertain the optimal level of therapist input in internet-based interventions. In addition, one should take into account differing variables of the sample groups. I would like to put forward that the answer to the optimal level of therapist input may lie in differing sub-groupings/cohorts. Perhaps the nuances between differing demographics are creating variance in levels of optimal involvement? As illustration, a highly educated and affluent cohort might need less therapist involvement, compared to an uneducated and impoverished cohort, because they are likely to have the skills and resources to be more self-supporting. This would align with treatment methods

being tailored to fit the needs of their target groups. Perhaps amount of involvement can be researched and tailored to fit different demographics. More research into optimal level of therapist input may heighten efficacy or allow a greater number of people to benefit from such treatments as they would be receiving the correct amount of therapeutic time in accordance to their needs. Perhaps tailored levels of therapist input could aid the lessening of attrition through development of the therapeutic alliance.

### 6.3.6 REMINDERS

Reminders are mechanisms used within an intervention to encourage participants to engage with the intervention. Some reminders that have been used in these studies comprise of: emails; phone calls; and text based messaging (Berger et al. 2014; Carlbring et al., 2012; Christensen et al., 2014; Hedman et al., 2011; Hoifodt et al., 2013; Kok, van Straten, Beekman, & Cuijpers, 2014; Tillfors et al., 2011; van Ballegooijen et al., 2013). Reminders sent to participants were reported in eight (n=8, 40%) studies (Berger et al. 2014; Carlbring et al., 2012; Christensen et al., 2014; Hedman et al., 2011; Hoifodt et al., 2013; Kok et al., 2014; Tillfors et al., 2011; van Ballegooijen et al., 2013). Of those eight only one study received no therapist input and was still reported to be effective (Christensen et al., 2014). Some studies did not make use of reminders but did incorporate contact with a therapist (Berger et al., 2011; Carlbring et al., 2013; Kleiboer et al., 2015; Paxling et al., 2011; Unlu Ince, Cuijpers, van't Hof, van Ballegooijen, Christensen, & Riper, 2013).

### 6.3.7 FOLLOW-UP ASSESSMENT

Most (n=15, 75%) of the trials included a follow-up assessment, which is unlike the Griffiths et al. (2010) review where only two (n=2) studies reported follow-up assessments. Follow-up assessments were scheduled between three months and one year following the initial intervention, with a median of 6 months. Three (n=3) trials reported a second follow-up (Christensen et al., 2014; Hedman et al., 2011; Paxling et al., 2011). Follow-ups and their relation to efficacy was discussed in section 6.2. A summary table of the number of trials to include a follow-up is shown below in Table 13.

Table 13: Assessment at Follow-Up

<b>Follow-up</b>	<b>Number of Trials</b>
No Follow-up	5
First Follow-up	12
Second Follow-up	3

### 6.3.8 RECRUITMENT

Recruitment methods and study inclusion criteria were also found to be widely varied and overlapped, with all studies (n=20) using more than one method of recruitment. Recruitment methods were grouped into print media (electoral roll, magazines, newspapers, posters, brochures, school advertising), electronic media (Internet forums, online newspaper, radio, social media, survey, national television interview, website advertising), primary care (patients in primary care, referrals from primary care, parents in treatment), secondary care (waitlists of outpatients), and original study participants. The main recruitment methods focused on printed newspaper advertisements (n=12), while website advertisements (n=10) were the second most used method. Social media was utilised by four studies, most of which noted Facebook as their site of choice (Boiler et al., 2013; Proudfoot et al., 2013; Unlu Ince et al., 2013; van Ballegooijen et al., 2013). Primary care was noted in one case and referred to general practitioner and nurse referral (Hoifodt et al., 2013). There was one case of random selection from an electoral roll via email (Christensen et al., 2014), as well as one follow-up study that used only participants from its original study (Hedman et al., 2011). The methods of recruitment are listed in Table 14 below.

Table 14: Recruitment Modality

<b>Recruitment Modality</b>	<b>Number of Instances</b>
Print Media	21
Electronic Media	20
Primary Care	3
Secondary Care	2
Original Study Participants	1



Within South Africa, advertising for psychological interventions can be made through a variety of print and electronic media. This is possible due to existing infrastructure of print newspapers, and as is discussed in 4.4.7, access to internet platform technology is on the rise in South Africa. Primary care medical physicians and practising registered psychologists are ideally positioned to inform those individuals who come to them for aid about internet-based interventions for mental care. Wide spread advertising can be foreseen as able to reach the vast majority of South Africans, possibly excluding those in severely remote areas where awareness of such interventions may take marginally longer. However, with persistent advertising these areas may also eventually be made aware of such internet-based interventions.

### 6.3.9 SAMPLE SIZE

As with the Griffiths et al. (2010) review sample sizes varied widely. Sample sizes across studies (n=20) ranged from 19 to 720 (median=89) with a total of 3 569 participants. For those studies targeting depression disorders (n=8) the range in sample size was 48 to 284 (median=88) with a total of 904 participants, those only targeting anxiety disorders (n=9) had arrange of 19 – 558 (median=89) with total of 1 363 participants, and those targeting both depression and anxiety disorders (n=3) had a range of 45 to 720 (median=537) with a total of 1 302 participants. The samples sizes grouped according to conditions targeted are summarised in Table 15 below.

*Table 15: Sample Size*

<b>Intervention According to Targeted Condition</b>	<b>Sample Size in Range values</b>	<b>Median</b>
Across All Studies	Range = 19 – 720	Median = 89
Depression Disorders	Range = 48 – 284	Median = 88
Anxiety Disorders	Range = 19 – 558	Median = 89
Depression and Anxiety Disorders	Range = 45 – 720	Median = 537

### 6.3.10 CONTROL GROUPS

As was found in the Griffiths et al. (2010) review the design of control groups here were predominately Waitlist Control (WLC). Three trials (n=3) chose to employ a placebo, and two trials (n=2) reported to have allowed Treatment As Usual (TAU) within their waitlist control group (Boettcher, Berger, & Renneberg, 2012; Carlbring et al., 2012; Christensen et al., 2014; Kok et al., 2014; Vernmark et al., 2010). A waitlist control group is a type of control where the group essentially waits for the treatment group to be processed until after the post-test period before they themselves can have access to the treatment (Jackson, 2009). Post-test results of the treatment group are then compared to the post-test results of the waitlist control that has not yet received the intervention and can be thought of as a neutral control, and in so doing ensuring a higher internal validity for the study's results (Jackson, 2009). Treatment As Usual means that participants continued to receive psychological and/or pharmacological treatment that they were already being provided outside of the context of the study (Jackson, 2009). Types of controls used and their number are summarised below in Table 16.

*Table 16: Type of Control Group*

<b>Type of Control Group</b>	<b>Number of Trials</b>
WLC	15
WLC with TAU	2
Placebo	3

### 6.3.11 INTENTION-TO-TREAT DESIGN

In the Griffiths et al. (2010) review the majority (n=16) of the trials made use of an Intention-To-Treat (ITT) design. In an ITT design data on all patients who were initially admitted to a study (i.e. randomised to either an experimental or control group) is included in the final analysis. This includes analysing patient data even where there has been noncompliance with treatment regime, protocol deviations, or withdrawal from the study. Jackson (2009) argues that ITT designs allow for analysis that is closer to the conditions faced outside of the ideal study environments (i.e. closer to 'real world' conditions). In my research I observed that all

(n=20) of the studies included in the review made use of an ITT design. In all cases (n=20) ITT analysis was used at post-test (assessment directly after the intervention), after which some studies used a completers-only design for follow-up analysis. Four trials (n=4) reported using a completers-only analysis in their follow-up analysis (Boiler et al., 2013; Unlu Ince et al., 2013; Lintveldt et al., 2013; Kleiboer et al., 2015). A completers-only analysis is a design that only uses data from those participants who completed the intervention (Jackson, 2009). Types of analysis designs used and their number are summarised in Table 17.

*Table 17: ITT Analysis*

<b>Type of Analysis:</b>	<b>Number of Trials:</b>
ITT	20
Included Completers-Only Analyses (At follow-up analysis)	4

### 6.3.12 GEOGRAPHIC LOCATION

Most (n=13, 65%) of the studies included in my review were conducted in Sweden (n=7, 35%) and the Netherlands (n=6, 30%). Three (n=3, 15%) studies were completed through collaboration between Germany and Switzerland. Australia is the only country outside of Europe publishing the results of RCT research on this topic. Table 18 shows the number of studies according to the country conducting the research.

*Table 18: Geographical location*

<b>Geographical Location of the Studies</b>	<b>Number of Trials</b>
Australia	1
Austria	1
Germany and Switzerland	3
Netherlands	6
Norway	2
Sweden	7

The countries conducting these studies are ‘first world’ countries, or countries that are considered to be economically, technologically, and socially developed in comparison to others. They are also countries that have structured their healthcare systems towards universal healthcare, and in being ‘first world’ countries are more financially secure to offer such healthcare (HealthDirect, 2014; International Health Care System Profiles, 2018; International Student Insurance, 2018;). It is interesting to note that there are no studies in this review from countries that are not focused on a universal healthcare system. The United States of America (USA), for instance is a large country but no studies have reached this review. The USA also has done away with its universal healthcare system, and is considered ‘first world’ (Zhu & Johansen, 2014). The lack of American studies could be due to a few reasons: 1. Studies were conducted but did not meet the criteria for this review. 2. Not having a focus on a universal healthcare systems could mean a lack of focus on lower cost treatment methods. 3. Studies are not accessible via the channels searched for this review. 4 An unknown confounding variable is in play.

Expanding on point 2, not having a focus on universal healthcare could cause a lack of research into any new methods that are aimed to lower the cost burden of Health Departments. Budgets that are aimed at national coverage are logically more constricted than those that are funded through tax and personal payments. Such constricted budgets benefit from treatment plans that are lower in cost while retaining efficacy. The USA may not seem to be researching internet-based interventions because their budget is not calling for lower cost treatment options. Unfortunately, their system results in people who cannot personally afford healthcare to be left untreated.

However, Canada which is larger than the USA, is also not represented in any of the included studies. Canada is considered to be a ‘first world’ and it does have a universal healthcare system (Government of Canada, 2016). It would seem, then, that not having a focus on a universal healthcare system is not the only possible reason for the USA’s lack of published research into internet-based interventions. Considering this reviewer’s experience of not being able to access a number of studies (see Appendix D) it would seem possible that publication bias and/or the three other factors noted above could be causing a lack of studies to review.

South Africa is most certainly in need of lower cost treatment options, whether or not a universal healthcare system is successfully put in place. It is possible that studies of other

‘non-first world’ countries are not represented in this review because they do not believe they are technologically advanced enough to run psychological internet-based interventions. In addition, perhaps they have not yet accepted the amount of damage done to citizens and economy by depression and anxiety disorders. Countries who have the means are leading the way for us to follow, and then we can adapt their findings to our own needs.

### 6.3.13 FUNDING

As no cost to future users was declared in any included study this information does not appear in Appendix C, although it is still considered of value to this section. While cost to future users of these interventions was not declared in any of these studies a number of studies did note the cost effectiveness of delivering internet-based interventions in comparison to face-to-face therapy, due to relieved client-load and time constraints (Berger et al., 2014; Boettcher et al., 2012; Hoek et al., 2012; Paxling et al., 2011; Lintvedt et al., 2013). Therefore, it would follow that cost to users would at least be lower in internet-based interventions when compared to face-to-face interventions. However, it is noted that Vernmark et al. (2010) claimed that self-help with guidance is a more cost-effective intervention than e-mail therapy which is at a cost that does not correlate with an increase in effect size.

Some internet-based interventions (non-South-African) that are currently in operation do give prices on their websites. This gives us an idea of what costs to expect, however costs would change according to South African context; e.g.: whether or not government subsidy could lend aid. MoodGYM, which is an intervention programme that was included in this review through the Hoifodt et al. (2013) study gives their price as \$39 Australian dollars (R391,50c) for one year’s subscription (MoodGYM, 2018). That’s just over R32 per month. In relation to the average price of face-to-face therapy (R600 - R1200 per session) one can quickly see the lower cost of internet-based interventions for the user (SADAG, 2015).

Only two of the studies did not declare where the funding for their research originated from (Boettcher et al., 2012; Lintvedt et al., 2013). While one study stated that they received ‘support’ from a number of institutions in their acknowledgements section, it is unclear what is meant by the word ‘support’ (Unlu Ince et al., 2013, p. 11). For the other 17 studies the

name of the institution providing funding was clearly given. The majority of research funding stemmed from research councils that were mostly governmental but occasionally non-government based (Carlbring et al., 2013; Hoifodt et al., 2013; Vetenskapsrådet, 2016; The Research Council of Norway, 2015; Trimbos Instituut, 2016). In Sweden, within the government-initiated research institution, Vetenskapsrådet, board members are often simultaneously employed by Universities as professors etc. and are considered experts in their field (Carlbring et al., 2013; Forte, 2017; Vetenskapsrådet, 2016). This inclusion of academic staff is also seen at the Netherlands Trimbos Instituut, which is registered as a non-profit organisation, and partly funded the van Ballegooijen (2013) study (Trimbos Instituut, 2016).

Non-government funding tended to originate from independent research institutions who are guided by government policy, or in the case of van Ballegooijen et al. (2013) funding originated from a university (Hoifodt et al., 2013; The Research Council of Norway, 2015; ZonMw, 2018). ZonMw, which is the organisations full name, funded three of the included studies, and is independently run but seems to receive its commission from the Netherlands Ministry of Health, in addition to other departments of the Netherlands government and promotes itself as healthcare focused (ZonMw, 2018; Hoek et al., 2012; Kleiboer et al., 2015; Kok et al.; 2014). Table 19 is a summary of funding information across the studies.

*Table 19: Funding Declarations*

<b>Funding</b>	<b>Number of Trials</b>
Not Declared	2
Received ‘Support’	1
Government (Public)	15
Non-Government (Public and/or Private)	2

In regard to declaration of conflicts of interest nine studies reported conflicts of interest, four reported no conflicts of interest, and seven did not report or mention any possible conflict of interest; Appendix C. Of the nine that did declare possible conflicts of interest the range of conflicts fell into five thematic groupings: 1. One or more authors were involved in the development of the evaluated programme and had employment attachment to universities that provided public access to those programmes (Christensen et al., 2014; Lintvedt et al., 2013).

In these instances, it was stated that the authors did not benefit from any financial gain (Christensen et al., 2014; Lintvedt et al., 2013). 2. Authors of studies worked for companies that sold products, or themselves sold products, related to their research study (Carlbring et al., 2012; Carlbring et al., 2013; Vernmark et al., 2010). 3. Funding was given by the same institute that developed the programme under evaluation (Boiler et al., 2013). It was stated that no financial rewards were gained by the author or institute for the interventions (Boiler et al., 2013). 4. One author of a study was employed by the same journal of the studies publishing, as an academic editor (Strom et al., 2013). 5. One author was a speaker from two pharmaceutical companies and received funding from four such companies (Kok et al.; 2014). Table 20 (over the page) is a summary of the number of trials to declare (or not) conflict of interest.

*Table 20: Conflicts of Interest*

<b>Conflict Declaration</b>	<b>Number of Trials</b>
Conflict Openly Declared	9
Reported No Conflict	4
Not Reported	7

Funding can become an issue when funding is derived from sources that have personal or monetary interests in the outcomes of studies. This may throw suspicion on the credibility of such outcomes. For the most part the included studies of this review did report clearly on who their funding bodies were, as can be viewed in Appendix C. There were a small number that did not state this clearly (n=4), one of which were found to be ineffective and did not report having been reviewed by an ethics committee (Boettcher et al., 2012). Since Boettcher et al. (2012) self-reported their intervention to be ineffective it is less concerning that they did not declare being reviewed by an ethics committee or declare their funding provider. Concern would be high if they reported their intervention to be highly effective. As it stands no included study reporting high efficacy failed to report having been reviewed by an ethics committee or reported being funded. However, Paxling et al. (2011) failed to give the name of the ethics committee that reviewed them, leaving readers unable to check that their study

was ethically approved. Tillfors et al. (2011, p. 155) declared their research to be ‘supported’ by a funding institution. This review is assuming that by the word ‘supported’ Tillfors et al. (2011, p. 155) mean financially funded.

As the results indicate, the majority of these studies were funded through organisations that were set up and run by their governments. In which case, most of the included studies were funded with finances from their governments whom of course received such money from taxes of its citizens. No mention was made within the included studies as to whether they intended to use their interventions in public or private sectors, as perhaps this was not relevant within their context.

However, it can be argued that research that is funded with finances collected from the public should be made available for use by the public, since they are the source of that funding. If such research lead to the creation of an intervention that was withheld from the general public that could be seen as unethical. A complication to this is that after an intervention has been developed the cost does not end there. Maintenance and running costs such as costs to include therapist input come after the implementation of an intervention. On a practical level it would seem that if a government can afford to pay those running costs then they should ethically open the intervention up to the public, if they cannot then only those fiscally affluent individuals could afford to pay and receive treatment. This practical difficulty could result in ethical concerns if people cannot receive needed care as they cannot afford private care and are not being aided through the government. In this line of reasoning it is an ethical imperative for governments to engage in ways to fund national care. As the surrounding literature indicates Universal Health Care is indeed the way in which affluent countries are headed (Asaria et al., 2016; Barber, & Rosenberg, 2017; Barofsky, 2003). Conversely, what if a country is not financially affluent and is unable to cover exorbitant health care costs for its public? In that instance, interventions that are lower in cost but are still as effective as the usual treatment options could be of remarkable assistance.

In terms of funding within South Africa, we are a country that is not largely fiscally affluent and would benefit from health care interventions that were lower in cost but remain as effective the usual treatment options. The South African government, while it is steadfast in its determination to phase in the National Health Insurance system to bring about universal healthcare, cannot be thought of as fiscally affluent at the present time. As explored in Chapter 3, South African is experiencing financial difficulty due to recent downgrade to non-



investment grade status (junk status) as well as numerous and public corruption allegations against the governing party ( Cronje, 2017; Fin24, 2017; le Cordeur, 2017; News24, 2014). In order to avoid the ethical issue of neglecting large sections of the population who cannot afford private health care South Africa's government could take advantage of the benefits of using internet-based interventions for depression and anxiety interventions. Such interventions have been proven to be at least as effective as face-to-face therapeutic care and are notably cost effective in comparison (Griffiths et al., 2010; Hedman et al., 2014; Paganinia et al., 2018; Wagner, Horn, & Maercker, 2014; Ye et al., 2014). In addition, if research into developing or altering an etic internet-based intervention were to be funded through the government (i.e. accumulated public funds) there would be ethical reasoning to open that tested intervention to the public, and not limit it to the private sector.

## 6.4 PARTICIPANT CHARACTERISTICS

In order to fulfil the goals set by the research questions of this review a wide range of characteristics found in the studies need to be explored in terms of their potential impact on the feasibility of implementing internet-based interventions of anxiety and depression in the South African context. I have tabulated a summary of key participant characteristics in Appendix B and discuss each in turn in this section of the chapter.

### 6.4.1 AGE

The mean age of participants across all of the studies included in this review (n=20) was 34.18 years. It is interesting that only two studies (Hoek et al., 2012; Tillfors et al., 2011) targeted younger individuals aged 16 to 19 years (i.e. late adolescence). Griffiths et al. (2010) likewise reported only two studies aimed at adolescents and children. Given the high prevalence of mental health distress and suicidal ideation amongst adolescents more interventions aimed at this age demographic would be appropriate. The highest mean age in any single study was 49.2 years old (Strom et al., 2013) and no trials were conducted specifically for older adults, unlike in the Griffiths et al. (2010) review where one trial focused on the elderly. This is an oversight given that prevalence rates for depression peak in

older adulthood (above 7.5% among females aged 55-74 years, and above 5.5% among males aged 55-74 years) (World Health Organization, 2018a).

#### 6.4.2 GENDER

The gender of the participants was noted as either male or female in all studies (Berger et al., 2011; Berger et al., 2014; Boettcher et al., 2012; Broiler et al., 2013; Carlbring et al., 2012; Carlbring et al., 2013; Christensen et al., 2014; Hoifodt et al., 2013; Hedman et al., 2011; Paxling et al., 2011; Proudfoot et al., 2013; Strom et al., 2013; Tillfors et al., 2011; Unlu Ince et al., 2013; Vernmark et al., 2010). No studies noted participants as transgender. This could be the case either because the participants were not given the option to select transgender, or they opted not to. The discussion to follow therefor can unfortunately only address the cisgenders of men and women, as that was the information given in the original studies. I suggest that future research report on all genders, not only cisgenders, to allow for more accuracy in conclusions.

Across all studies, 70.66% of participants were identified as female while only 29.34% of the participants were identified as male. It is unsurprising that more women than men are included in the studies under review given that there is a significant gender difference in rates of depression and anxiety. Women are reported as having higher levels of depression and anxiety (Cromby et al., 2013). In Chapter Two I reported that depression is more common among females (5.1%) than males (3.6%) (World Health Organization, 2018a) and anxiety is also more common among females than males (4.6% of females worldwide compared to 2.6% of males worldwide) (World Health Organization, 2018a).

Although females are generally the ones to seek out therapeutic intervention, that correlation does not equate to the conclusion that males do not need intervention, rather that they avoid it, possibly due to stigma (Nam et al., 2010; Rosette et al., 2015).

The results of this review showed that women are still the predominant participants in psychological interventions. This could mean any of three events are occurring. Stigma for men may not be a factor at all, which seems highly unlikely. Secondly, stigma is a factor but not the only factor preventing men from seeking help through psychological intervention. Lastly, men remain cautious and have yet to realise the lessening of stigma through internet-

based intervention. Rosette et al. (2015) conducted a study showing that men whom seek help are perceived as incompetent. If this were generalisable, this ridicule for seeking help could lead men to avoid help-seeking behaviour in order to avoid being perceived as incompetent, for their own perceived survival. This in addition to Hammer and Vogel (2010) and Wisch, Mahalik, Hayes, and Nutt (1995) studies, that also discussed help-seeking behaviour, indicate that some men interact differently in therapy to women.

Wisch et al. (1995) write about gender role conflict in men and that conflict's effects on help seeking behaviour. It was found that those men who were highly gender conflicted (and were in the condition group that focused on emotional discussion) were the least likely to indicate that they wanted psychological help (Wisch et al., 1995). It is for this reason that I believe stigma is not the only reason men would have avoided participation in the 20 analysed studies of this systematic review. Another factor is at play. It would seem that as is true for conventional therapeutic practice so it is true for internet-based intervention, that a majority of men would avoid the emotional space of therapy as it is not compatible with their socially constructed gender role or sense of self as being unemotional. This 'incompatibility' should be taken into consideration when internet-based interventions are being developed, perhaps giving men the space to express their troubles in a way that they are comfortable with. The Wisch et al. (1995) study indicate that therapy focusing on cognition (thoughts) show better results with highly gender role conflicted men. Cognitive behavioural therapy (CBT) that dominates internet-based interventions for depression and anxiety disorders could prove effective for such a group if they could be encouraged to attempt it. This method of treatment would allow these men to face and process their problems without feeling as though they are being made 'weaker' by discussing their emotions, after which they may be more comfortable in the therapeutic space and more amenable to emotional discussion, if it is needed. Discussing their thoughts could perhaps bring up emotions in these men, but the focus of discussion in CBT could remain on the thought processes giving them the distance to vicariously explore and come to terms with their emotions. Syed, Baluch, Duffy, and Verma (2012) reported that men who had previously received counselling were more positive about attending future counselling sessions. This gives hope that the number of men making use of counselling services will rise.

In addition to men avoiding therapy due to a tension between its methods and their sense of self I would like to add that they do not seem to have yet largely attempted the stigma

lessened environment of internet-based interventions, perhaps due to entrenched caution. If they had attempted it *en masse* between 2010 and 2015 it is not reflected in this review. If they were to attempt internet-based interventions they may find they are not stigmatised as such interventions could be anonymous, in addition to focusing on thought processes instead on mainly emotions in CBT.

Obviously with the research gap in African Psychology these theories are based on Western cohorts and may change when related to a South African context. Therefore, in addition to internet-based interventions taking care to allow for comfort in self-expression through method of therapy, and anonymity for the participants, cultural adaptation should be considered.

What might also be of benefit in a good advertising strategy that eases the fears of highly gender role conflicted men in regard to thought focus in CBT and lowered if not nullified stigma through use of internet-based interventions. This is not to say that South Africa would need gender specific internet-based interventions, not at all. Gender does not affect outcomes in CBT according to a large review conducted by Cuijpers et al. (2014).

### 6.4.3 LANGUAGE

For the most part there seems to be an understanding within the included studies that participants need to be able to understand information from the interventions in order for participants to engage and successfully navigate them. A number of studies went so far as to set their inclusion criteria to include only those individuals who were sufficiently literate in the language used by the internet-based intervention (Berger et al, 2014; Boiler et al., 2013; Hoek et al., 2012; Kleiboer et al., 2015). This indicates the importance of language in order to gain benefit from a treatment intervention. Logically it follows that if a participant is not literate in the language used by the intervention they would not be able to access the knowledge imbedded in that treatment and would therefore not gain as much benefit from the treatment as a person could if they were literate and could therefore engage more fully with the intervention.

In South Africa literacy is of nationwide concern (Howie et al., 2016; van den Berg, 2016). Results from an international study has shown that South Africa has an incredibly low level

of literacy amongst school going children (Howie et al., 2016). If the literacy level is low amongst children who are being educated one can extrapolate that it would be lower for the elder generation who received less education. This is a concern and barrier to implementation for implementation of an internet-based intervention within South Africa that would seek to aid those least fortunate and most effected by apartheids education regime.

Solutions to this problem may lie in making use of home languages as languages for the interventions, in avoidance of bias. Use of a language that a participant is familiar in would bolster their understanding of the treatment and its underpinnings and allow for a higher chance of efficacy. As adapting and running such interventions in an array of languages may prove costlier than one I would suggest making use of languages that are most prevalent, such as English, Afrikaans, and IsiZulu. Perhaps beginning with the most prevalent language would be most cost effective, with the intension of later timeous translation. Bilingualism may have to be trusted to support those who are not literate in the predominant languages until such a time where it is financially possible to adapt intervention for use all of South Africa's official languages, as would be ideal.

#### 6.4.4 EDUCATION

The level of education was noted as being high for most trial participants. In most of the studies included in my review (n=14, 70%) more than half (58%) of the participants reported that they had completed or were completing studies at a university or college. One study (n=1, 5%) included only university students in their trial (Lintveldt et al., 2013). One study (n=1, 5%) was focused on high school students only (Tillfors et al., 2011) and four studies (n=4) did not record the participants education level (Carlbring et al., 2012; Hedman et al., 2011; Paxling et al., 2011; Proudfoot et al., 2013). The levels of education reported across all of the studies is summarised in Table 21.

*Table 21: Education Level*

<b>Education Level</b>	<b>Number of Trials</b>
Tertiary education	15

High School	1
Not Reported	4

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In regards to education in South Africa, in comparison to the tertiary levels of education found in reviewing the 20 studies that were mostly established first world countries, South Africa being a new democracy that is still changing in order to bring about equality has much lower levels of education. As previously described in Chapter 4, The Global Competitiveness Report 2017-2018 presents data showing South Africa's education system is rated as being of poor quality (Schwab, 2017). Whilst the 2016 Progress in International Reading Literacy Survey ranked South Africa last in comparison to 50 participating countries. This lack of literacy could prove to be a challenge in implementing an internet-based intervention. However, it is not an insurmountable challenge. More therapist input time would be needed to process and correct any issuing in understanding. In cases where an individual is unable to read voice calls could be made to clarify instructions. Written instructions could be made as simple as possible, and participants could ideally be able to choose to participate in which ever language they are most proficient in.

#### 6.4.5 EMPLOYMENT

Just under half of the studies (n=8, 40%) reported on participants employment status. Where this data was provided it appears that rates of employment reported by participants is above the current European Union average of 72.2% for people aged 20 to 64 years of age (EuroStat, 2018). This may be as a result of high levels of tertiary education among study participants. It is also worth noting that employment in countries such as Germany, Norway, Switzerland, Sweden and the Netherlands is generally higher than in other European counties such as Greece, Spain, and Portugal where austerity measures have negatively impacted the economy. It also appears that unemployment levels varied considerably. Unemployment rates in the European Union member states vary considerably but the average unemployment rate is 6.9%. I argue that the upper end of the range reported in Table 22 (below) may be an indicator of the effects of anxiety and depression on employment. In Chapter One I reported that social anxiety can be a barrier to employment and a factor contributing to individuals remaining dependent on social support that is provided by the state. The findings of research

undertaken by Himle et al. (2014) indicate that there are much higher rates of unemployment among persons living with anxiety and depression than those without.

*Table 22: Employment Status*

<b>Employment Status</b>	<b>Range</b>
Employed	Range = 81.8% - 95.3%
Unemployed	Range = 4.7% - 18.2%

This review found the studies mostly comprised of employed individuals, unlike the unemployment rate present in South Africa. In one small respect unemployed could be seen in a positive light, in the instance of psychological interventions. It would potentially give participants more time to interact with an intervention, presuming that their time is not wholly taken up by other non-financing activities, such as child or elderly care.

More notably being unemployed would most likely mean a lack of finances to spend on data, that one would need to be able to participate in an internet-based intervention. Inability to access the internet due to costs of data was discussed above in the section on Technology and Data Access.

#### 6.4.6 TECHNOLOGY AND DATA ACCESS

Internet-based interventions are logically and intrinsically dependant on technology in order to exist and function. Without access to a computer or mobile phone with internet access (the platform on which internet-based Interventions function) participants would simply not be able to participate in such an intervention. The included studies were based in countries such as the Netherlands that are more technologically advanced in comparison to South Africa (Dutta, Lanvin, and Wunsch-Vincent (Eds.), 2017). Even if South Africa is not as advanced in this area there is still growth as the infrastructure of information and communication technologies has been growing in South Africa, allowing for internet access to an ever-larger proportion of the country (Statistics South Africa, 2013). Perhaps not every person in South Africa has access to the internet but there are a consistently growing number that do and that could receive assistance via this platform. The second limiting factor in this area is that of the cost of data it takes to access the internet in South Africa.

For an internet-based intervention to be successful in South Africa it would need to prevent drop out or inability to take part in such an intervention due to low funds for data. I would like to put forward a few suggestions that may help or lead to further ideas. Firstly, internet-based interventions could be programmed simply, e.g. no pictures, to allow for the least amount of data use possible. Secondly, design internet-based interventions in such a way that modules do not have a time frame, thereby allowing participants to complete modules as their data allows; however, this could have the detriment of people losing interest or patience in the intervention or prevent timeous feedback. Lastly, a text-based software application (app) such as WhatsApp could be developed that uses less data than websites and is partially functional with no access to the internet; i.e.: one can look at old conversations (Khachaturian, 2017). WhatsApp is reported to use approximately 310 kilobytes (KB) per one minute voice call (Khachaturian, 2017). Emoticon could possibly also be useful in participants conveying their emotions through a text based medium. In addition, feedback can be given such as with Fitbit, the exercise monitor (Fitbit, 2018). Fitbit allows one to set goals and then helps record them, after which, assumedly, feedback is given (Fitbit, 2018). Bolinger (2015) notes initial costs in development of an app would be more than the development of a website. However, in the long term an app could prove more useful in lowering attrition rates through sustained interaction via offline use, instead of the possible frustration caused by not being able to access internet websites.

Sample characteristics that were present in the 20 studies do not hold true in a South African context. The overall sample characteristics of the 20 studies produced an 'image' of the average participant in those studies (Appendices A, B, & C). That 'image' is that the average participant of those studies was a tertiary educated, employed, and female. These participants having mostly had a tertiary education would be highly familiar with using technology and be more independent in correctly following intervention instructions. This would mean less time would need to be spent on explanation and correcting issues, and more time spent on therapeutic progress. However, employed individuals may have less time to participate fully in such interventions. By contrast to the reviewed studies of this review South Africa needs internet-based interventions that cater to the specifications of the majority of its populous. The average participant for such an intervention could be imagined as: primary to high school educated, unemployed, and male or female.



## 6.4.7 MEDICATION

Reported use of medication was roughly equivalent to that of Psychological Treatment History (n=11). Emphasis was made in these studies on the stability of medication taking, through the participant inclusion criteria. Those applicants who had not been taking their medications consistently for a pre-set number of weeks were excluded. In this way those applicants who were still adjusting to the mind/behaviour altering effects of their medications were excluded. If they had not been excluded the adjustment to their medication may have occurred during the programme and therefore altered results; i.e.: results could be awarded to the intervention when in actuality they were the results of medication. In other words, inconsistent medication consumption would be a confounding variable in such studies. Adherence to medication treatment regimens are important for the design integrity of such studies.

Of the studies that gave numbers of participants using medication, the majority were reported as not having been on medication at the time of the intervention (Berger et al., 2011; Berger et al., 2014; Carlbring et al., 2013; Hoifodt et al., 2013; Strom et al., 2013; Vernmark et al., 2010). Division of medication users between treatment and control groups seems to be balanced in the included studies. Table 23 is a summary of information on participants' use of medication during trials.

*Table 23: Receiving Medication*

<b>Medication</b>	<b>Number of Trials / Range</b>
Taking Medication	Range = 5.88% – 37.1%
Not Taking Medication	Range = 62.9% - 94.12%

## 6.5 ETHICAL CONSIDERATIONS

Appendix C is a tabulation of the ethically related themes that emerged through use of NVivo 11 and through engagement with this reviews literature review. The themes that emerged were: possible publication bias, clarity of eligibility criteria including screening for suicidal ideation, attrition rates, and ethical approval. Ethical issues regarding funding were noted in 6.3.13 in conjunction with a wider discussion on funding. These themes can also be described

as methodological considerations, especially publication bias, as they have an effect on methodological processing. However I have discussed them here because they are ethical issues that create methodological issues, rather than simply being issues of methodology.

### 6.5.1 A POSSIBLE CASE OF PUBLICATION BIAS

Appendix D is a list of 37 presumed trials that were found to be inaccessible by this review. They were detected through the Cochrane Central Register of Controlled Trials however they were not accessible to me as a university student in South Africa either through them or in a search via other data bases. The other data bases that were searched were Scopus, PsycARTICLES, and WorldCat. I say ‘presumed trials’ because the titles do not mention being a protocol for a study, and they were registered with agencies such as the Australia New Zealand Clinical Trials Registry (ANZCTR). This gives the impression that these trials were undertaken and completed. However, the names of authors were not always given, which is unusual for published research studies. No Digital Object Identifier (DOI) numbers were given for any of the 37 trials on the list. Although not highly unusual this too may indicate that these trials were not published.

For the sake of argument, one could make the assumption that these trials were conducted and completed but the results of which were not published. What effect does not publishing results have? It results in a specific type of bias called Publication Bias (PB). As Carroll, Toumpakari, Johnson, and Betts (2017) describe it, PB occurs when studies are not published, or results are not completely included in the published works. PB is believed to be a prevalent issue in research that causes a knowledge gap and therefore affects the outcomes of other studies and systematic reviews negatively (Carroll et al., 2017). One can imagine that literature reviews built on surrounding studies could more easily become skewed if they do not have access to all pertinent information, because of lack of publication. This review may have been able to include an unknown number of additional studies from the 37 listed in Appendix D. The inclusion of more studies could possibly have changed or strengthened the conclusions drawn from this literature review. A more in-depth statistical analysis may have been possible which could have resulted in more significant understanding of developing efficacy in internet-based interventions for depression and anxiety disorders.

If these were studies that were not published because the results proved to be negative, that their interventions were found to be ineffective, then this publication bias is damaging in that information that could help researchers avoid the same pitfalls is being withheld. Ulrich, Miller, and Erdfelde (2018) write of the danger of effect sizes being inaccurate when studies only report significant results. Carroll et al. (2017) suggest that more journals specifically for publication of negative/null hypothesis results be created to correct for such problems.

There is much researchers can learn from studies that produce negative results. This review made extensive use of those studies that were reported as ineffective, in order to highlight ground covered and move research forward. An ineffective intervention does not mean that the study needs to be deemed unsuccessful and therefore unpublishable.

Again, for the sake of argument let us assume that these trials were completed and published but are not accessible within the country of South Africa. In what way then is limiting publication to certain countries any different from publication bias? The simple answer is that it is not different, not for the researchers working in countries that are not permitted access. Where that information is inaccessible research will have a knowledge gap, which may or may not skew research depending on how significant the inaccessible research is. As a worldwide discipline we should be encouraging researches to openly publish their studies without judgement so that we are able to learn from each other and produce research that is more accurately generalisable and effective.

I cannot say for certain whether or not these 37 registered trials were ever completed or published, not having access to more information. I have attached what information I have on them as Appendix D. I have attached the list in the event that it proves useful to others.

### 6.5.2 CLEAR ELIGIBILITY CRITERIA

All studies did state their eligibility criteria, although to different degrees of clarity, (Appendix C). Studies that noted their criteria in point form were assessed as being easier to find and read which gave them clarity. If these studies had not reported on their eligibility criteria then one could assume that no such criteria formed part of their study and would have resulted in the lowered validity and reliability of their research. If an internet intervention did not report on the age of the applicants we would not know if that intervention was effective

with older or younger generations. More seriously, if a study involving depressed persons did not report having screened for suicidal ideation the readers of the study would not know if dropout was the result of suicide which could point to potentially ineffective or even harmful intervention.

Common inclusion criteria of the reviewed studies included: (a) access to the internet, (b) a significant score on a tool or questionnaire that measured the disorder under investigation, and (c) if prescribed medication was being taken the dosage would have had to have been constant for a set amount of time (Berger et al., 2011; Carlbring et al., 2013; Hoifodt et al., 2013). A positive result in the screening for suicidal ideation was the most common exclusion criteria across all of the studies included in my research (see Appendix C).

Only two studies did not report on whether they screened participants for risk of suicide before inclusion into the study (Hedman et al., 2011; Lintvedt et al., 2013). One study did mention having screened participants but did not mention the procedure or name of the screening tool (Kok et al., 2014). The other 17 studies did screen for risk of suicide as part of their eligibility criteria, (Appendix C). Table 24 summarises the number of studies that did and did not report having completed screening for risk of suicide.

*Table 24: Screening for Risk of Suicide*

<b>Screening for Risk of Suicide</b>	<b>Number of Studies:</b>
Reported Screening	17
Did Not Report Screening	3

### 6.5.3 ATTRITION RATES

With the majority of reported studies making use of the intention-to-treat (ITT) analysis design (Appendix A), the attrition rate (the proportion of participants in a given study that are reported to have left the study before completion) is a crucial parameter to monitor (Gupta, 2011). This is due to the influence that departed participants possess on subsequent calculated effect sizes; drop-outs are counted as uninfluenced by the study (Gupta, 2011). There is the added concern of the potential damage to those individuals who drop out of assumed needed care. If participants whom are in need of care are dropping out of interventions one cannot

make the assumption that such participants will seek psychological assistance elsewhere. They may have become jaded and unwilling to seek further help, which could be potentially dangerous to their mental health. Care should be taken to discover why attrition occurs and if such participants could be referred to psychological programmes more to their liking.

Attrition rates for each included study were either calculated, or drawn from the respective reports, and tabulated in Appendix C. For ease of analysis, the treatment and control groups are presented separately, (Appendix C). All the following values in this section were calculated from information recorded in Appendix C.

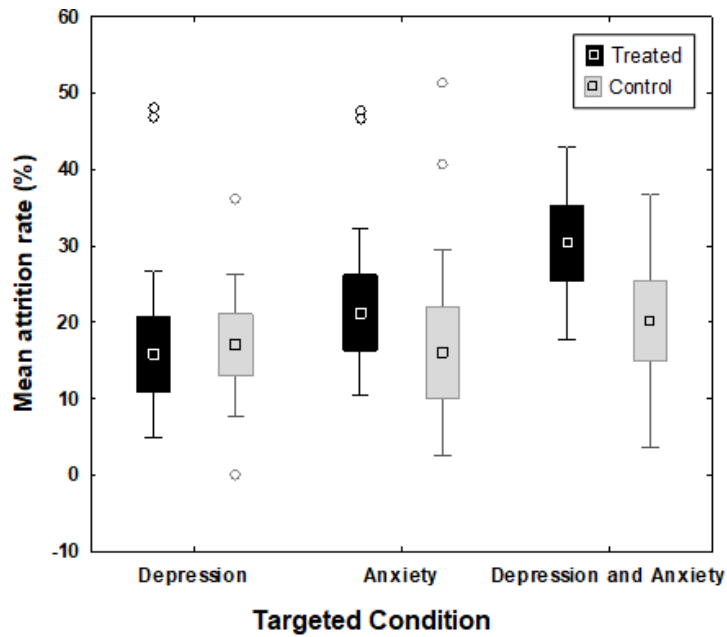
Overall, attrition rates remained similar between tested and control groups in all reported studies, with an average of 28.03% (SD = 18.59%; SE = 2.55%) and 22.94% (SD = 15.98%; SE = 2.63%) respectively, with a range from 0% to 73.47%. The overall attrition rates across all included trials is summarised in Table 25 (below).

*Table 25: Attrition Rates*

<b>Targeted Condition:</b>	<b>Attrition Rates:</b>
Overall Across Trials, Treatment Groups	28.003% (SD = 18.59; SE = 2.55)
Overall Across Trials, Conditions Groups	22.94% (SD = 15.98; SE = 2.63)

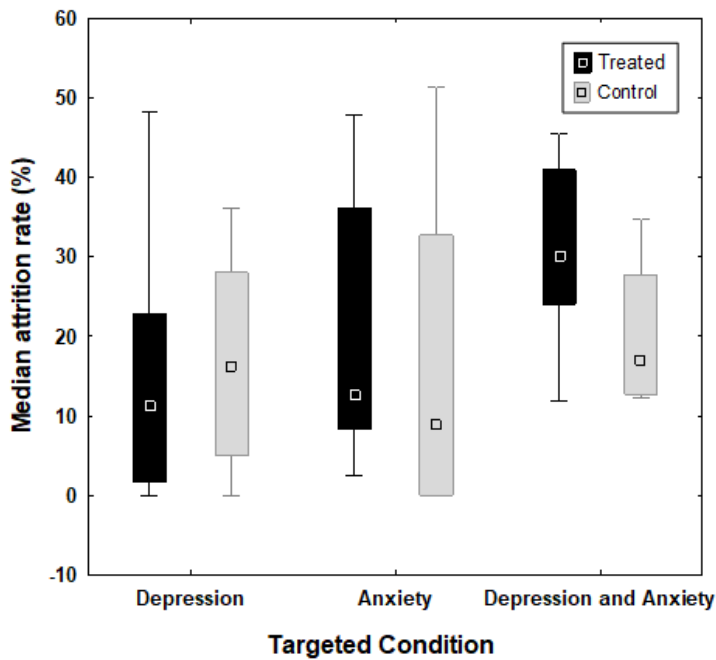
Further statistical analysis confirmed that similar levels of attrition remain between treatment conditions and their controls. At post-test for the depression targeted interventions (Appendix C), the mean attrition rate for the treatment groups was 16.30% (SD = 18.81%; SE = 5.95%), and 16.33% (SD=14.49%; SE = 5.12%) for the controls. For the anxiety targeted interventions, the mean for the treatment groups was 22.50% (SD = 18.42%; SE = 5.32%) and for the controls 14.76% (SD = 16.41%; SE = 5.19%), post-test. For the three mixed depression and anxiety targeted interventions the post-test mean was 30.39% (SD = 12.02%; SE = 4.91%) for treatment groups and 20.24% (SD = 10.41; SE = 5.21) for control groups. The bar-graph in Figure 2 (below) provides a visual representation of the data above showing the means and standard error of the three groups of targeted conditions.

*Figure 2: Overall Attrition across All Trials*



Given the large differences in the number of trials between tested outcomes (Appendix C), the large differences between treatment and control groups within tested outcomes (e.g. Berger et al, 2014); and the non-normal distribution of attrition rates within tested outcomes, a nonparametric method of analysing the differences in mean attrition rates was used. A graphical representation of the nonparametric distribution of the attrition rates is provided in Figure 3 (over the page).

*Figure 3: Distribution of Mean Attrition Rates across Studies*



As comparison between two data sets (treatments, and controls) was required the Kolmogorov-Smirnov two-tailed test was chosen and processed through the software programme Statistica (Pratt & Gibbons, 1981). Attrition figures were taken from all treatment and control groups across the three targeted conditions post-test, without follow-up rates. This was done to compare attrition rates within the time frame of treatment before loss to follow-up occurred. When comparing attrition rates between experimental and control groups, the Kolmogorov-Smirnov two-tailed test results showed no apparent differences between the experimental and control groups with p values being above 0.5, as can be seen in Table 26 below.

Table 26: Kolmogrov-Smirnov Test Results of Treatment and Control Groups

	Max Neg Difference	Max Pos Difference	p-value	Mean Treated	Mean Control	Std.Dev. Treated	Std.Dev. Control	Treated n	Control n
<b>Depression</b>	-0.2833	0.1666	p > .10	15.82	17.05	17.09	12.95	12	10
<b>Anxiety</b>	-0.1000	0.400	p > .10	21.29	16.08	17.17	18.85	12	10
<b>Depression &amp; Anxiety</b>	-0.1666	0.5833	p > .10	30.39	20.23	12.02	10.41	6	4

p > 0.10 between treatment and control groups

This shows a lack of statistical difference in attrition between treatment and control groups across the three treatment conditions, before follow-up test where undertaken.

All three intervention targeted conditions demonstrated p values above 0.05 and can therefore be considered to have no significant differences in attrition rates between the tested and control groups. This lack of significance is largely attributed to the non-normal distribution in attrition rates across the included studies.

To ascertain whether a specific targeted condition (depression, anxiety, or depression and anxiety) had attrition rates significantly different from the other two, a Kruskal-Wallis ANOVA comparison of the mean attrition rates was compared across the three targeted conditions. For all included control groups across outcomes, a lack of significance was calculated  $H(2, n=24) = .7172; p = .6986$ . The p value here is well above 0.05, indicating great similarity in the distribution of attrition rates between the tested outcomes. For the treatment groups no significant statistical difference was found between targeted treatment conditions either,  $H(2, n=30) = 3.0435; p = .2183$

Analysis has not revealed any significant difference between treatment and control groups of the intervention targeted outcomes, nor a significant difference across target outcomes within the treatment or control groups.

#### 6.5.4 ETHICAL APPROVAL

Ethical approval was sought and granted for 19 of the studies. Only one did not include whether or not they had sought or were granted ethical approval by any committee (Boettcher et al., 2012). One of the 19 studies to have reported ethical approval by a committee did not give the name of the committee, removing the ability of a reader to seek confirmation from that committee (Paxling et al., 2011).

The ethical committees themselves were of differing organisational origins, some being regional committees and others University committees, (Appendix C). Table 27 is a summary of the number of trials that reported or did not report seeking and being granted ethical approval through an ethics comity. The implication of not successfully passing a study through an ethics committee is that the rigour of methodology and therefore legitimacy of results becomes suspect. This systematic review can be seen to have a high degree legitimacy as 19 of its 20 studies were granted ethical approval.



*Table 27: Ethical Approval*

<b>Ethical Approval</b>	<b>Number of Studies:</b>
Sought and Received Ethical Approval	19
Not Reported	1

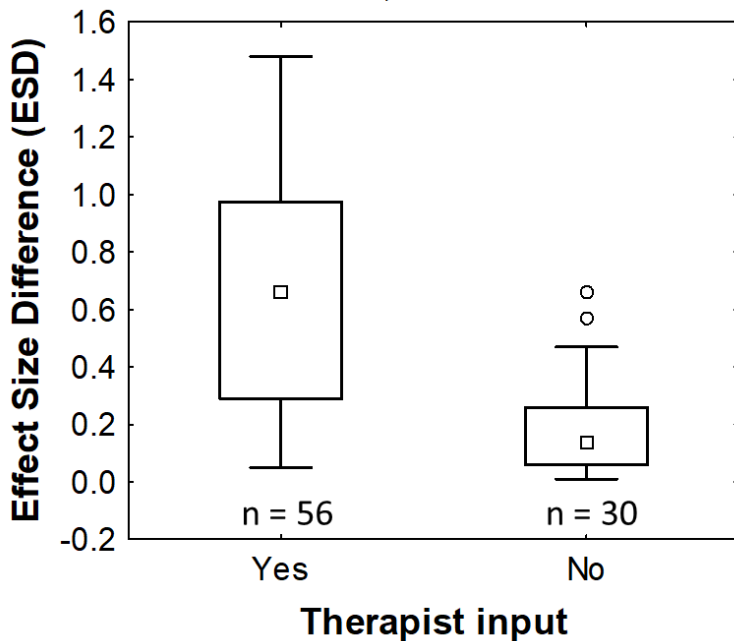
## 6.6 MAIN EMERGENT THEMES

These themes became salient from the above results in their potential for increasing efficacy. They are described and discussed here in detail.

### 6.6.1 THERAPIST INPUT

As the literature in this area of study suggests therapist input has a positive impact on efficacy of internet-based interventions for anxiety and depression. I performed further statistical analysis to assess if this could be observed in my own research. At first I assessed the data without dividing it into targeted conditions (depression, anxiety, depression and anxiety) and simply compared the effect size differences (ESD) of those that reported having therapist input against those that did not. In this way any differences within each of the three groupings can be observed. Figure 4 (below) is a bar graph showing that overall ESD was larger when therapist input was included. Amount of therapist input was not measured throughout all of the reviewed studies so this graph indicates unknown amounts of therapist input having a positive effect on ESD.

Figure 4: Comparing ESD to presence or absence of therapist input



Presence of therapist input has a mean ESD near 0.7 with error bars from just above 0 to near 1.5. Absence of therapist input shows a mean ESD near 0.1 with error bars from 0 to near 0.5, and two outliers near 0.6. Statistical analysis was done using the Kolmogorov-Smirnov two-tailed test in order to ascertain significance between ESD of those studies with and without therapist input, which were seen as two independent groups. Difference in ESD was found to be significant as can be seen below in Table 28. However, the amount of measured outcomes were larger in the group that included therapist input, by almost half; Yes = 56, No = 30.

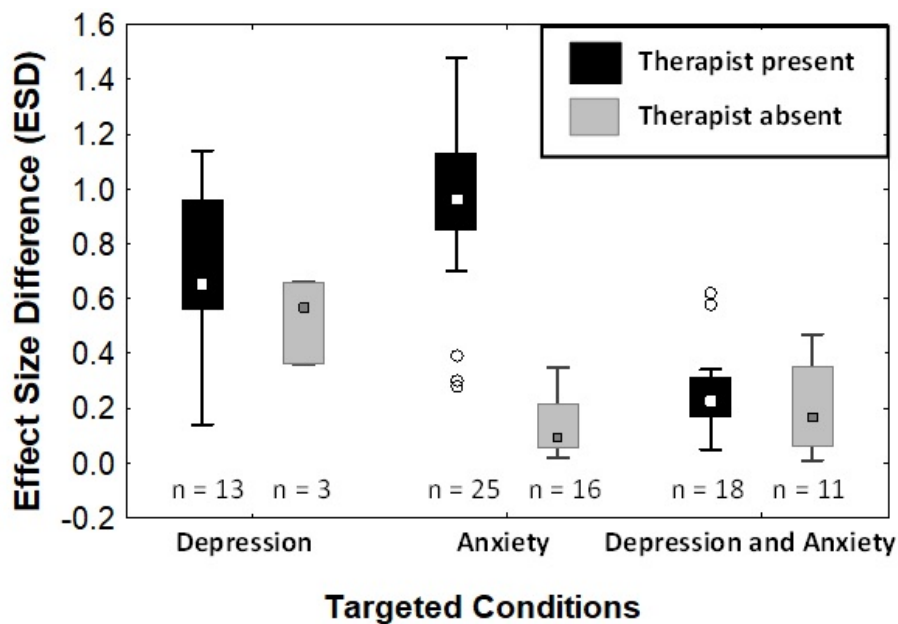
Table 28:  $p < 0.001$  ESD & Therapist Input

variable	Kolmogorov-Smirnov Test (Spreadsheet1) By variable Therapist input Marked tests are significant at $p < .05000$								
	Max Neg	Max Pos	p-value	Mean Yes	Mean No	Std.Dev. Yes	Std.Dev. No	Valid N Yes	Valid N No
Between-group ESD	0.00	0.555952	$p < .001$	0.677143	0.195333	0.411219	0.174054	56	30

Table 28 reports  $p < 0.001$  ESD and Therapist Input. Sample size of the groups are not equal at  $n=56$  (therapist present) and  $n=30$  (therapist absent). After confirming that there is a significant difference between inclusion and lack of therapist input in the data set as a whole I

separated the data back into the treatment targeted conditions (depression, anxiety, depression and anxiety). I compared inclusion and lack of therapist input within each targeted condition, so the comparison remained between two independent groups. Below is Figure 5 (over the page), a bar graph showing the differences in ESD between those studies that included therapist input and those that did not. The targeted condition of depression had means that are visually close together, while anxiety's means were well separated. The treatments that targeted both depression and anxiety disorders also had means that were situated closely together. Sample sizes of the targeted conditions remained skewed which could affect the outcome.

Figure 5: ESD compared to therapist input



This figure shows ESD differences in means between treatments that included therapist input and those that did not, separated into targeted conditions. Sample numbers of outcome measures were: depression n=13 (therapist present), n=3 (therapist absent); anxiety n=25 (therapist present), n=16 (therapist absent); depression and anxiety n=18 (therapist present), n=11 (therapist absent).

As was previously done, Kolmogorov-Smirnov two-tailed test were run to ascertain if significance between inclusion of therapist input and lack thereof was evident in each targeted condition. Table 29 (over the page) shows that there was no significant difference between the means of those that included therapist input and those that did not in studies that

targeted depression disorders. However, the sample sizes are small and largely skewed could be impacting the outcome.

Table 29:  $p > 0.10$  Depression and Therapist Input

Measured Outcomes=Depression Kolmogorov-Smirnov Test (Spreadsheet1) By variable Therapist input Marked tests are significant at $p < .05000$									
variable	Max Neg	Max Pos	p-value	Mean Yes	Mean No	Std.Dev. Yes	Std.Dev. No	Valid N Yes	Valid N No
Between-group ESD	-0.076923	0.461538	$p > .10$	0.693077	0.530000	0.300621	0.153948	13	3

The targeted condition of depression showed no significance in therapist input ( $p > 0.10$ ). Sample sizes were uneven at  $n=13$  (therapist present),  $n=3$  (therapist absent)

Table 30 below shows a significant difference between the ESDs of the treatments outcome measures of the studies that included therapist input and those that did not. This indicates that including therapist input has significantly increased the ESD of the outcome measures of the studies that targeted anxiety disorders. Because the sample sizes are somewhat skewed there may be a limit to the generalisability of this finding.

Table 30:  $p < 0.0001$ , Anxiety & Therapist Input

Measured Outcomes=Anxiety Kolmogorov-Smirnov Test (Spreadsheet1) By variable Therapist input Marked tests are significant at $p < .05000$									
variable	Max Neg	Max Pos	p-value	Mean Yes	Mean No	Std.Dev. Yes	Std.Dev. No	Valid N Yes	Valid N No
Between-group ESD	0.00	0.937500	$p < .001$	0.971200	0.128750	0.323191	0.099457	25	16

The targeted condition of anxiety did show significance of therapist input ( $p < 0.001$ ). Sample sizes were uneven at  $n=25$  (therapist present),  $n=16$  (therapist absent).

Table 31 (over the page) shows no significance ( $p > 0.10$ ) between those outcome measures that included therapist input and those that did not. Sample sizes were less skewed but

although the combined sample size of outcome measures was 32, these came from only three studies (Hoek et al., 2012; Kleiboer et al., 2015; Proudfoot et al., 2013).

*Table 31:  $p > 0.10$  Depression, Anxiety & Therapist Input*

<b>Measured Outcomes=De&amp;A Kolmogorov-Smirnov Test (Spreadsheet1) By variable Therapist input Marked tests are significant at <math>p &lt; .05000</math></b>									
<b>variable</b>	<b>Max Neg</b>	<b>Max Pos</b>	<b>p-value</b>	<b>Mean Yes</b>	<b>Mean No</b>	<b>Std.Dev. Yes</b>	<b>Std.Dev. No</b>	<b>Valid N Yes</b>	<b>Valid N No</b>
<b>Between-group ESD</b>	-0.161616	0.343434	$p > .10$	0.257222	0.200909	0.147561	0.165979	18	11

Therapist input held no significant difference ( $p > 0.10$ ) within the merged targeted conditions of depression and anxiety disorders group. Sample sizes were less uneven at  $n=18$  (therapist present),  $n=11$  (therapist absent). This shows us that within the studies that aimed to treat depression and anxiety conditions simultaneously inclusion or exclusion of therapist input was not significant to the effect size difference. This could possibly be due to a small sample size, or perhaps an unknown confounding variable, as testing the inclusion of therapist input in the separate anxiety and depression interventions showed a significant differences for both. Isolating such a confounding variable is beyond the scope of this review.

In summary, the results show that therapist input does have a significant effect on effect size difference of the reviewed studies targeting anxiety and depression disorders in separate interventions. However, this was not the case for interventions targeting anxiety and depression disorders simultaneously.

Whether or not therapist input makes a significant difference to the efficacy of internet-based interventions for depression and anxiety disorders has been of interest to researchers for a number of years. (Griffiths et al., 2010; Palmqvist, Carlbring, Andersson, 2007). As detailed in previous chapters therapist input, the therapeutic contact a participant has with the therapist involved, is limited in face-to-face practises in the number of patients one therapist can accommodate, limited number of qualified professionals, time, and transport (Department of Health, Republic of South Africa, 2011; Health Professions Counsel Of South Africa, 2017a; Loelige et al., 2016; Nyatsanza et al., 2016; Statistics South Africa, 2016c). This limitation of therapist input can be alleviated by internet-based interventions in that they allow therapists

to engage with a higher number of patients for less time whilst transport becomes a nonissue (Sue et al., 2013; Kleiboer et al., 2015). Internet-based interventions take place on a different platform (online) to face-to-face therapy, a platform that places a distance between the therapist and patient. It can be seen as logical to test how wide that distance can be before efficacy deteriorates.

This review completed basic meta-analyses that showed inclusion of therapist input does lead to greater effectiveness than those studies that were unguided;  $p < 0.001$ . This finding conforms with the findings of other systematic reviews (Baumeister, Reichler, Munzinger, & Lin, 2014; Griffiths et al., 2010; Palmqvist et al., 2007). However, although I had a well sized overall sample of outcome measures to work with, when these were grouped into those using therapist input and those not the sample sizes became skewed;  $n=56$  (therapist present) and  $n=30$  (therapist absent). This may alter the ability of this finding to be widely generalisable. It does however indicate a move within studies to make use of therapist input more than not. The majority of studies, 13 of 20, did include therapist input as part of their treatment (Berger et al., 2014; Carlbring et al., 2012; Carlbring et al., 2013; Christensen et al., 2014; Hedman et al., 2011; Hoifodt et al., 2013; Ince et al., 2013; Kok et al., 2014; Paxling et al., 2011; Strom et al., 2013; Tillfors et al., 2011; van Ballegooijen et al., 2013; Vernmark et al., 2010) These studies did not include or make comparisons to any treatments that did not include therapist input.

The decision to rather include therapist input is possibly because therapist input has been found to be beneficial by reviews such as Griffiths et al. (2010) and such studies now prefer to include therapist input in order to heighten efficacy. Therefore, my skewed data set may be generalisable in that it shows a progression away from exclusion of therapist input. It would seem that researchers are taking note of knowledge gleaned by systematic reviews and are changing their treatment designs accordingly.

When I took a closer look at each individual targeted condition group (depression, anxiety, depression and anxiety) I found that the group of anxiety was the only one the Kolmogorov-Smirnov two-tailed test identified as having a significant difference between inclusion and exclusion of therapist input;  $p < 0.001$ . Neither the group of depression nor that of depression and anxiety showed any significant difference in their inclusion of therapist input; both  $p$  values being  $p > 0.10$ . The reason for this could be that therapist input is of more importance in treating anxiety, however, due to the small sample sizes of the depression and depression

and anxiety groups that correlation cannot be made at this point. It is possible that with larger sample sizes a significant difference may be affirmed in the groups of depression, and depression and anxiety. Now is the time for researchers to explore the amount and quality of therapist input that is needed to attain decent efficacy.

## 6.6.2 THE THERAPEUTIC ALLIANCE AND ATTRITION

Through analysis attrition (dropout) became salient in this review. Review of the surrounding literature flagged therapist input as a cornerstone of treatment in face-to-face therapeutic practice, but the full roll of therapist input in internet-based interventions remains unclear (Andersson et al., 2012; Bordin, 1979; Horvath & Greenberg (Eds.), 1994). It has been noted that the role of therapeutic alliance may play out differently or simply be less important in internet-based interventions (Andersson et al., 2012). In order to debunk this idea further, and to possibly discover if therapeutic alliance does affect attrition rates in these studies, statistical and thematic analysis was undertaken.

Basic statistical analysis (Table 26) was undertaken that showed that there was no significant difference across studies between treatment groups and their controls at post-test. This indicates that, as a data set, participants were dropping out of control groups at a similar rate to that of the treatment groups. This did not alter when the treatment groups of the targeted condition groups (depression, anxiety, depression and anxiety) were evaluated separately; no significant differences in attrition were found across treatment groups of targeted conditions. This is dissimilar to what Fernandez et al. (2012) found in their meta-analysis, where, as mentioned in Chapter 2, they found a high incidence level of attrition in studies that used e-therapy (internet-based intervention). As mentioned in Chapter 2, van Ballegooijen et al. (2014) found guided iCBT (internet-based CBT) to have a significantly higher attrition rate than face-to-face CBT. Although adherence in iCBT was found to be adequate if not equal to that of face-to-face CBT; adherence being the competency of following the instructions of the intervention. Since my results do not match that of the literature I set about to discover why that could be.

When I thematically compared attrition rates and efficacy a new pattern emerged. Of the six most highly effective studies (effect sizes over 0.80) all had relatively low attrition levels at post-test; ranging from 0% to 28.85%. (Berger et al., 2011; Berger et al., 2014; Hedman et al.,

2011; Hoifodt et al., 2013; Paxling et al. 2011; Tillfors et al., 2011). All six studies also included some level of therapist input. I compared this information to the studies that were reported to be ineffective. Of the five studies that were reported as not being effective, three of them had attrition rates that were high in both treatment and control groups; 34.78% to 46.94% (Hoek et al., 2012; Unlu Ince et al., 2013; van Ballegooijen et al., 2013). Two of these did include therapist input on some level but were short in duration at five and six weeks (Unlu Ince et al., 2013; van Ballegooijen et al., 2013). The two ineffective studies that had low attrition did not include therapist input and were also short in duration at four weeks each (Boettcher et al., 2012; Carlbring et al., 2012).

One would think that the low attrition rate in the highly effective studies could justifiably be caused by the inclusion of therapist input. As literature explored earlier suggests, retention and adherence to treatments in face-to-face therapy is impacted by the therapeutic alliance, or bond of trust, between therapist and patient (Andersson et al., 2012; Bordin, 1979; Horvath & Greenberg (Eds.), 1994). If this were undeniably true for online interventions one would likely see a reverse of this effect in studies that were not effective. However, what this review has found is that there are studies that have included therapist input but had high attrition rates and were found to be ineffective, and studies that did not include therapist input but had low attrition rates and were ineffective. However, when one takes duration of the treatments into account the data supports the idea that therapist input increases efficacy and can lessen attrition. The two ineffective studies that did include therapist input were shorter than that of the highly effective studies (Unlu Ince et al., 2013; van Ballegooijen et al., 2013). When I compared this to the van Ballegooijen et al. (2014) review I noticed that the average length of the face-to-face CBT interventions was 12 to 28 sessions while the iCBT interventions were only 5 to 9 sessions in length. This indicates that the participants did not have enough time or exposure to therapeutic feedback and therefore the intervention was more likely to be unsuccessful and have a higher attrition rate. This is in line with the literature as Fernandez et al. (2012) found that attrition was lowered as the length of the intervention increased. The seemingly high attrition rate of internet-based interventions can therefore be explained through the length of the interventions. Longer interventions have lower attrition rates.

The two ineffective studies that did not include therapist input but also did not experience high attrition had an even shorter duration of four weeks each (Boettcher et al., 2012; Carlbring et al., 2012). Contrariwise, this indicates that the intervention was so short as to



reduce the time that attrition was possible, therefore showing a lower attrition rate. By this I mean that the longer an intervention is the more time there is for participants to drop out, by contrast the shorter the timeframe the lower the rate of drop-out. It is unknown if this holds for interventions that are excessively long. Research would need to be conducted on the attrition of chronic use of internet-based interventions.

This goes to support the idea that therapist input increases efficacy and can lessen attrition, although it is still unclear as to the amount or type of therapist input. By and large duration of treatment and therapist guidance is indicative of effect size in this review. Highly effective studies had longer durations (range, six to 10 weeks), which meant longer exposure to therapist input, while moderate studies had a combination of low to long duration (range, five to 10 weeks) but did not always include therapeutic input.

I compared the most effective studies with the ineffective as I wanted to hone the contrast as to which study characteristics are effective and which are not. This does not mean that there is nothing to learn from those studies that were moderately efficacious. For moderate efficacy studies it would seem that mostly when duration was long no therapist input, or no reminder, was included, and when therapist input was included, duration was short (Boiler et al., 2013; Carlbring et al., 2013; Christensen et al., 2014; Kok et al., 2014; Kleiboer et al., 2015; Lintvedt et al., 2013; Strom et al., 2013; Vernmark et al., 2010). In addition, these studies generally held moderate attrition rates in comparison to the highly effective and ineffective studies. These moderate attrition rates show that therapist input and duration also have an effect on attrition rates.

In studies such as Christensen et al. (2014) show efficacy is possible without therapist input, albeit low efficacy. It is possible that their use of reminders helped to make up for not having therapist input. If, like the highly effective studies, efficacy is most probably affected by type of treatment method, duration, and inclusion of therapist input, then the Christensen et al. (2014) study is being affected by something similar to those characteristics. They did make use of CBT and had a long duration of 10 weeks (like the highly effective studies), which leaves therapist input (Christensen et al., 2014). Although, the reminders were not therapeutic in nature it is possible that they bolstered efficacy, as their inclusion (with no therapist input) seems to be the main difference between the Christensen et al. (2014) study and the highly effective studies. Efficacy bolstering through reminders alludes to the importance of contact, human contact, whether it is therapeutic or not. This contact may only be perceived, as

reminders could be automated messages, however, in Christensen et al. (2014) some participants received telephone reminders. This human contact may have bolstered efficacy in lieu of therapeutic input. The results do not account for confounding variables, such as differences in therapist ability. However, it would seem that in order to have a highly effective study the design would need to include therapist input, reminders, and be at least eight weeks in duration.

The data points to the importance of therapist input for efficacy. This is important for the therapeutic alliance as exposure to therapeutic input creates a bond between therapist and patient, or so it is in face-to-face therapy (Bordin, 1979). Andersson et al. (2012) writes about the therapeutic alliance in internet-based interventions and that the relationship may work differently or is not as important in internet-based interventions when compared to face-to-face therapy. As mentioned in review of the literature Andersson et al. (2012) conducted a study to test the early therapeutic alliance in guided CBT internet-based interventions for depression and anxiety by using the Working Alliance Inventory (WAI) tool. Andersson et al. (2012) took into account that studies have been showing that therapist input/ guided interventions have produced higher efficacy results. While high scores were recorded for therapeutic alliance and comparable to face-to-face results Andersson et al. (2012) were not convinced that the therapeutic alliance was as important in internet-based interventions. They believe that the amount of therapeutic input in internet-based interventions does not equate to that in face-to-face therapy and that the WAI may be measuring something other than the therapeutic alliance (Andersson et al., 2012). As the time is shorter it is possible that participants were forming an alliance not only with the therapist but with the therapeutic process of the internet-based intervention itself. Andersson et al. (2012) alludes to the possibility of this when asking what the Working Alliance Inventory (WAI) tool was actually measuring, if not the bond between therapist and participant. It may be possible that the lessening of therapist input was being ameliorated by the sense of accessibility to the therapeutic benefit of the internet-based intervention itself. Andersson et al. (2012) suggest that participants were achieving equivalent scores from both the goal and task aspects of WAI because they were viewing the internet-based intervention as approved by the therapist. In other words, the participants perceived the exercises of the intervention to be an extension of the therapist and were therefore in agreement as to the goals and tasks of the intervention. They formed a bond with the internet-based intervention through association with the therapist. The constant presence of the intervention on their smartphone or computer could

also have added to the formation of a bond through a sense of continuous support. This constant presence allows for the user to use the intervention as and when they need. It allows for flexibility. This is supported by the survey questions completed by Unlu Ince et al. (2013) where 59% of the participants stated their reason to choose an internet-based intervention as being one of flexibility. Only 22% stated their reason as being one of privacy/ anonymity. This is likely mostly because the study was conducted with migrant peoples and therefore reasoning may change for other demographics.

More information may be gleaned from studies that look at the optimal level of therapist input as this may give a clearer understanding of the impact amount of therapeutic time in comparison to face-to-face therapy. However, no matter how differently the alliance works or whether or not it is important in internet-based interventions the data points to attrition rate having a correlation with therapist input, reminders, and duration of treatment; as is true for efficacy. The culmination of therapist input, reminders, and duration of treatment could be seen to indicate human interaction, i.e. the therapeutic alliance. This would indicate that the presence of the therapeutic alliance is affecting attrition and can be collated to the study characteristics of therapist input, reminders, and duration of treatment.

### 6.6.3 DURATION AND EFFECT SIZE

Interventions that reported being ineffective had intervention durations at and below six weeks (Boettcher et al., 2012; Carlbring et al., 2012; Hoek, et al., 2012; Unlu Ince et al. 2013; van Ballegooijen et al., 2013). The six effective studies had durations of treatment ranging from six to ten weeks (Berger et al., 2011; Berger et al., 2014; Hedman et al., 2011; Hoifodt et al., 2013; Paxling et al. 2011; Tillfors et al., 2011). There appears to be a clear distinction between the efficacy of interventions with shorter and longer durations. It is logical that the more exposure an individual has to an effective intervention the higher the probability of that individual being successfully treated. Length of exposure, with this group of interventions, begins to show gain on and after six weeks of treatment. Table 32 shows the duration in comparison to amount of interventions considered effective.

Table 32: Duration of Intervention & Effect Size

<b>Treatment Efficacy</b>	<b>Duration of Interventions</b>
Five (n=5) interventions that were ineffective	Less than six weeks
Six (n=6) interventions that were highly effective	More than six weeks

## 6.7 FEASIBILITY IN SOUTH AFRICA

Based on the results and discussion above, in comparing the characteristics of the included studies to the needs of South Africans, factors came to light that would support internet-based interventions for depression and anxiety disorders in South Africa. If these factors are observed during design and development of interventions this researcher believes that a higher quality of internet intervention can be achieved, one that is feasible and appropriate for use in South Africa. Further testing within South Africa to ascertain its appropriateness empirically is recommended. These factors are proven to be the most useful in creating a successful intervention in reviewed studies, tailored with South Africa's context in mind (Christensen et al., 2014; Hedman et al., 2011; Paxling et al., 2011). They could be used in a standalone intervention, inclusion to pharmacological care, or inclusion to outpatient care. These factors were selected in consideration of sample characteristics of the possible average South African intervention user, and characteristics of the studies included in the review. For example, because of South Africa's general low level of literacy, I would suggest more therapist/ guidance input than was recorded in the reviewed studies, in order to engage with the intervention more fully; the reviewed studies had mostly tertiary level literate participants. I have attempted to make use of information garnered from included studies in an effort to transform such interventions for appropriate use within South Africa. These factors were selected with South Africa's most vulnerable in mind; those who cannot afford private care but are also not receiving adequate care through governmental or non-governmental organisations.

The studies that were included in this review entailed sample characteristics and conditions that were starkly different from those found in South Africa. The average participant from the included studies was: tertiary educated, employed, and female. This is a stark contrast to the

average sample that would represent the most vulnerable of South Africans; Primary to High School educated, unemployed, and male or female. Study characteristics of the most efficacious studies included in this review as reported in and discussed above were: use of CBT; inclusion of therapist input; inclusion of reminders; and longer duration of intervention (six to 10 weeks). Internet-based interventions would need to keep this in mind when developing or adapting for use within South Africa. Table 33 below, consists of the following factors that were deduced/ drawn from the surrounding literature and systematic review of the included studies: use of cognitive behavioural therapy (CBT) as main treatment method; at least eight weeks in duration; include therapist input and reminders; 20 minutes per participant per week; intervention must be low cost; use language of highest accessibility across South Africa; separate depression and anxiety interventions; be anonymous; include suicide screening; implemented in the public health care sector. These factors and how they emerged are discussed below Table 33.

*Table 33: Implementation Feasibility Factors*

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Use of CBT as main treatment method
At least eight weeks in duration
Include therapist input and reminders
20 minutes per participant per week
Intervention must be low cost
Use language of highest accessibility across South Africa, initially
Separate depression and anxiety interventions (Ideally)
Be anonymous
Include suicide screening
Implemented in the public health care sector

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This table is a list of basic factors that should be considered when developing or adapting internet-based interventions for depression and anxiety interventions for use within South Africa. The right-hand side of the table notes references of chapter sections in this thesis that support the decision to include each characteristic. In accordance with each characteristic I will give a brief summary of reasons for each to justify why they should be included this list of factors for use in such internet-based interventions.

CBT was originally designed to treat depression (Dozois, & Beck, 2011). Since then CBT has been found to be highly effective in treating not only depression but anxiety as well (Hendriks et al., 2008; Pozzaa, & Dèttoreb, 2017; Prajapati, 2014). CBT is a highly effective method of treatment, and it is most certainly the most widely used in such internet-based interventions, as was found in the Griffiths et al. (2010) review and this review. Part of its efficacy may stem from the processes of CBT strengthening neural pathways as CBT activates certain brain areas (Porto et al., 2009; Shou et al., 2017). In addition, it is possible to adapt CBT for cross cultural use (Naeem, Waheed, Gobbi, Ayub, & Kingdon, 2011; Patel, & Hinton, 2017). As it is already a highly successful treatment in the sphere on online interventions there is little reason to experiment with the efficacy of other treatment methods, at least to begin with.

I recommend that such interventions run for a minimum of eight weeks and included therapist input and reminders because this combination was found to yield the most highly effective results, in this review. The six studies that were the most highly efficacious were: Berger et al. (2011), Berger et al. (2014), Hedman et al. (2011), Hoifodt et al. (2013), Paxling et al. (2011) Tillfors et al. (2011). This combination may influence the therapeutic alliance positively allowing for increased retention to the internet-based intervention. As discussed previously Andersson et al. (2012) notes the therapeutic alliance may function differently or may not be as important as in face-to-face therapy. If the therapeutic alliance was not important in internet-based intervention, then the addition of therapist input and reminders and length of exposure to those would not increase efficacy. This review found that their inclusion does increase efficacy. It is more likely that the therapeutic alliance functions differently rather than it being less important. Time engaging with a therapist is shorter in internet-based intervention than face-to-face interventions (Andersson et al., 2012). The shorter engagement time allows for lower costs to the participant (Paganinia et al., 2018). As the time is shorter it is possible that participants as forming an alliance not only with the

therapist but with the therapeutic process of the internet-based intervention itself. Andersson et al. (2012) alludes to the possibility of this in asking what the Working Alliance Inventory (WAI) tool was actually measuring if not the bond between therapist and participant. They are forming a bond with the internet-based intervention through association with the therapist. Even if this reasoning is found to not be the case, the inclusion of therapist input and reminders with at least eight weeks of duration has been found to increase efficacy.

It is also likely that this bond with the internet-based intervention is being bolstered through the ease of accessibility and flexibility, as many participants would access such interventions through a smartphone. Such technological use is not only limited to ease of use but also privacy. Internet-based interventions allow for levels of privacy not known before in psychological care. In this way stigma is lessened, as there is less threat of being exposed to the views of those who would ridicule participants. In order to further lessen the fear of stigma internet-based interventions can be designed for anonymity of the participants by allowing for anonymous signing in procedures, as was done in Berger et al. (2014).

There may be cause to believe that such interventions should be separate in terms of depression and anxiety disorders. CBT may be highly effective for depression and anxiety disorders as they are essentially different types of disorders with differing aetiologies. However, internet-based interventions are generally focused on targeting individual disorders. Only three of the 20 reviewed studies targeted depression and anxiety simultaneously, two of which were considered effective (Hoek, Schuurmans, Koot, & Cuijper, 2012; Kleiboer et al., 2015; Proudfoot et al., 2013). None of these three studies were highly effective; none had an effect size of  $d \Rightarrow 0.80$ .

However, while I suggest that internet-based interventions target depression and anxiety disorders in separate interventions for high efficacy this is more of an ideal. If it is at all financially possible this separation should be implemented. If it does not prove to be financially possible for South Africa then an internet-based intervention that targets both depression and anxiety would still be effective and would be a good starting point for implementation of such interventions.

The adaptation to include all of South Africa's 11 official languages may prove to be an ideal but non-feasible at present. As this is likely the case I would suggest the use of as many of

South Africa's most prevalent languages as possible for greater understanding and engagement with the intervention, such as English, Afrikaans, and IsiZulu, in that order as that is the order of most prevalence. Once South Africa's financial position improves, to the degree that funding can be provided for translation and ongoing website maintenance in multiple languages, such implementation would aid in alleviating cultural and language barriers to mental healthcare.

Two characteristics should not be optional: suicidal screening and use of any such internet-based intervention in the public sector. Screening for risk of suicide allows internet-based interventions to uncover such risk and intervene by directing the individuals to those who can help them, such as South Africa's Depression and Anxiety Group (SADAG). Incidentally, because internet-based interventions may attract those individuals who would normally avoid psychological care, the running of an internet-based intervention may bring to light many more individuals at risk for suicide. An increase in numbers that organisation who help suicidal individuals would need to be prepared for.

Lastly, internet-based interventions for depression and anxiety disorders should be made available to those who are most vulnerable and would benefit most for its implementation, the public sector. In order to implement and run internet-based interventions in the public sector costs have to be kept as low as possible without negating efficacy. Then those individuals who cannot afford private health care (and do not receive adequate care from government or non-government organisations) should receive treatment to alleviate inequality. All South Africans should have access to the psychological treatment that they require.



## **CHAPTER 7: CONCLUSIONS**

### **7.1 CHAPTER OVERVIEW**

This chapter is concerned with the conclusions drawn from the previous chapter. The aims of this research are reiterate briefly, followed by the main conclusions drawn from the systematic review and then the main conclusions regarding the feasibility of implementing depression and anxiety disorder internet-based interventions in South Africa. Research limitations, and suggestions for future research are then noted.

### **7.2 RESEARCH OVERVIEW**

This thesis aimed to conduct an updated systematic review on the efficacy of internet-based interventions for depression and anxiety disorders, and secondly to ascertain the possibilities and limitations for their feasibility in the South African context. This was achieved through systematic analysis of studies from 2010 to 2015 in accordance with pre-set eligibility criteria. Selected studies were then analysed thematically, and some themes were then statistically analysed using basic statics. Information from the analysis in addition to surrounding literature was used to address the second aim of this thesis, the possibilities and limitations of internet-based intervention for depression and anxiety within South Africa. This discussion took the form of detailing a list of factors that should be considered when developing internet-based intervention for depression and anxiety disorders for South Africa.

### **7.3 CONCLUSIONS DRAWN FROM THE SYSTEMATIC REVIEW**

Early in the analysis of this study it was found that the majority (n=15) of included studies were effective in that they had effect sizes above 0.20. The analysis then moved to the most effective studies ( $d \geq 0.80$ ), and what could possibly make them so. In order to accomplish this, I compared the most effective with those that were not effective. From that analysis it

was found that certain themes were present in the most effective that were not found in the non-effective. They included cognitive behavioural therapy (CBT), therapist input, and reminders to engage with the intervention, as well as being over 6 weeks long.

Given the discussion in Chapter 4, I would like to put forward the possibility that CBT combined with longer durations of treatment (6 weeks plus) are the reason behind long term efficacy of the internet-based interventions reviewed. I believe CBT's ability to strengthen neural pathways in the brain and lengthened exposure to that treatment has contributed to the viewed positive long-term results. I believe this biological explanation is possible because research is indicating that CBT remains the most widely used treatment method in internet-based interventions for depression and anxiety disorders (high efficacy) and that it strengthens neural pathways by alteration of thought patterns (Appendix A; Griffiths et al., 2010; Porto et al., 2009; Shou et al., 2017; Yang, Kircher, & Straube, 2014). It is not a leap in logic to assume that CBT's long-term efficacy in such interventions is due to its therapeutic effects on the participants. In fact, there have been studies that have begun exploring the effects of CBT's long-term impact on the brain (Schienle, Schäfer, Stark, & Vaitl, 2009; van der Straten, Huyser, Wolters, Denys, & van Wingen, 2017). Schienle et al. (2009) looked at the neural pathways associated with social phobia. This suggestion is merely a move from the purely psychological understanding of CBT's efficacy to include biology for a more holistic understanding of the results. A caveat of this suggestion is that although research points us in the direction of this explanation this review does not have the capacity to explore the effects of CBT on the brain fully. Future neuropsychology research would be required for production of empirical results from which to draw conclusions.

Durations of the ineffective interventions were shorter at 4-6 weeks. Three studies did not make use of reminders, in addition to three that did not include therapist input; these studies did not always overlap. One study did include therapist input but did not report the amount of time spent per participant, and did not make use of reminders, which could mean participant-therapist interaction was low (Unlu Ince et al., 2013).

Analysis of these characteristic and the surrounding literature led to the discussion on the importance of therapist input in these interventions. As was found in other studies and reviews this review, found that inclusion of therapist input did lead to an increase in effect size, as can be seen in Appendix A. This could logically be extended to the length of time a participant is exposed to the therapist interaction by duration of treatment. If duration of

treatment is short, less time will have been spent in therapeutic interaction with a therapist, thereby lowering efficacy. Future researchers need not excluded therapist input, unless they believe they have found a successful alternatives and wish to test that efficacy. The current question in such research has moved on to how much therapist input is optimal (Griffiths et al. 2010; Gershkovich, Herbert, Forman, Schumacher, & Fischer, 2017).

Discussions on therapist input and the other characteristics such a duration and reminders led to a discussion on the therapeutic alliance. Through consideration of the Andersson et al. (2012) paper it was concluded likely that the combination of these three characteristics is bolstering the therapeutic alliance present in internet-based interventions in addition to the intervention itself, which participants may be viewing positively through association of the therapist. This would bolster the claim of Andersson et al. (2012) that the therapeutic alliance does function differently in internet-based interventions, but not that it is unimportant. In its turn the therapeutic alliance may be having an effect on participants desire to adhere and complete the intervention thereby lowering attrition.

Lastly, it also came to light that internet-based interventions could be of benefit in that it could aid in the treatment of those who avoid psychological treatment due to fear of stigma. This could possibly be more so with men, who experience a higher degree of stigma associated with seeking psychological care than women. Together with use of a cognition focused CBT treatment internet-based interventions should be marketed towards men, but most certainly not only men. The reduction of stigma made possible through the privacy of internet-based interventions may well allow those at risk for suicide seek help, especially those who would not normally seek help through normal means.

#### 7.4 CONCLUSIONS OF FINDINGS FOR SOUTH AFRICA

Information garnered from the review of the included studies and surrounding literature of the needs of South Africa was used in order achieve this review's second aim. The second aim is to ascertain the possibilities and limitations of internet-based intervention for depression and anxiety within South Africa.

It was found that the sample characteristics were widely different. The studies average participant was tertiary educated, employed, and female. The possible average South African

participant would be primary to secondary school educated, unemployed, and male or female. In order to address these differences, a couple of changes could be made in the design of future internet-based interventions. These changes were: increased therapist input to 20 minutes per participant per week; a simplification of the internet-based intervention to allow for minimal data usage.

In addition, these changes are suggested as the limitations of such use in South Africa include poor literacy and high costs of internet data. Together with technological unfamiliarity, insufficiency of professionally trained therapists, poor literacy, and high costs of internet data are limitation that can be overcome by increasing therapist or guidance input and keeping the programming of the internet-based intervention simple as to not use data unnecessarily.

Themes of the most effective studies can be used on a South African population as they are culturally adaptive characteristics and can be viewed as possibilities. These characteristics were: use of CBT, inclusion of therapist input and reminders, and duration of at least eight weeks.

From ascertaining the limitations and possibilities I compiled a list of factors that could be used in developing or adapting an internet-based intervention for depression and anxiety in South Africa. The factors that formed the list were: use of cognitive behavioural therapy (CBT) as main treatment method; at least eight weeks in duration; include therapist input and reminders; 20 minutes per participant per week; intervention must be low cost; use language of highest accessibility across South Africa; separate depression and anxiety interventions; be anonymous; include suicide screening; implemented in the public health care sector.

This review has found that an internet-based intervention for depression and anxiety within South Africa is most certainly a possibility in terms of efficacy and believes that it would be of pronounced value in treating South Africans who would otherwise receive no treatment at all. It would also be useful as an addition to pharmaceutical therapy, or as an outpatient therapy treatment programme.

## 7.5 RESEARCH LIMITATIONS

Unfortunately, 37 studies had the potential to be included in this study but could not be accessed, although several attempts were made (as discussed in 6.5.1). These studies were registered through research trial organisations, but it remains unclear as to whether or not they were published. If they were completed and were then held back from publishing it may be a case of publication bias. I have attached a list of study details for potential use to others, in Appendix D. It is unfortunate that these studies could not have been further examined for possible inclusion within this study as a larger sample may have allowed for more in depth statistical analysis. It is unlikely that their inclusion would have largely altered the conclusions.

## 7.6 SUGGESTIONS FOR FUTURE RESEARCH

This systematic review has shown that an effective internet-based intervention for depression and anxiety within South Africa is possible and has given a list of factors to assist in achieving high efficacy levels in future research. This list of factors would need testing with a complete internet-based intervention before implementation of such an intervention could be undertaken. Studies could be conducted that tests the factors' validity and reliability for standalone interventions, or as interventions that are accompaniments to other treatment as usual interventions. A cost analysis should also be conducted. Once an internet-based intervention design has been decided upon then a cost analysis study should be undertaken. Such a study would need to give clear indication of the costs of developing, implementing and maintaining the chosen intervention.

It could be considered a missed opportunity if a national internet-based intervention for depression and anxiety disorders was not formulated, tested, and implemented. South Africa is in a position to gain the benefits of numerous years of research on such internet-based interventions which knowledgeable professionals could take and adapt to form culturally appropriate and unbiased interventions, available at lower costs than face-to-face therapy. Currently no national scale public internet-based intervention for depression or anxiety disorders exists in South Africa, although interest in such interventions is evident through publications and the SADAG (Adeloye, Adigun, Misra, & Omoregbe (2017); South Africa

Depression and Anxiety Group). SADAG would possibly be a decent platform on which to begin such a national endeavour as it is already a well-established aid, with internet presence, to those suffering from anxiety and depressive disorders. Studies on mental health internet interventions need not be limited to South African. The systematic reviews of Arjadi et al., (2015) and Griffiths et al. (2010) both did not yield any quality studies on low or middle income countries. This is a clear indication that such research not being completed or published.

Gender is another area that is not being fully addressed. All the studies that I reviewed noted participants simply as male or female. (Berger et al., 2011; Berger et al., 2014; Boettcher et al., 2012; Broiler et al., 2013; Carlbring et al., 2012; Carlbring et al., 2013; Christensen et al., 2014; Hoifodt et al., 2013; Hedman et al., 2011; Paxling et al., 2011; Proudfoot et al., 2013; Strom et al., 2013; Tillfors et al., 2011; Unlu Ince et al., 2013; Vernmark et al., 2010). I suggest that future studies make the effort to ask the preferred gender of their participants in order to make more accurate conclusions.

Lastly, Therapist input was not reported in detail by the included studies (Hoifodt et al., 2013; Kok et al., 2014; Strom et al., 2013; Tillfors et al., 2011; Unlu Ince et al., 2013; Vernmark et al., 2010). This lack of information creates difficulty in correctly assessing the optimal amount of therapist care needed for statistically significant and high effect size outcomes of treatments. Detail in this regard is advantageous as guided interventions have been shown to have higher efficacy than unguided interventions in this review as well as several other reviews (ref). Degree of therapist input was not made clear by every study in the Griffiths et al. (2010) review either. I would like to put forward that it become common practice for research studies of psychological internet-based interventions to include detail on the amount of therapist time spent with each patient, and the mode of communication, i.e.: face-to-face or email, etcetera. In addition, if possible given expenses and time constraints, an assessment of the therapeutic alliance would be beneficial. This could be achieved with a Likert scale tool such as the Working Alliance Inventory (WAI) or one of its adaptations.

## 7.6 CHAPTER CONCLUSIONS

Findings from the systematic review portion of this research were that certain characteristics (main themes) were present in the most effective that were not found in the non-effective. They included cognitive behavioural therapy (CBT), therapist input, and reminders to engage with the intervention, as well as being over 6 weeks in duration (section 7.3). These characteristics could be taken up by future studies to improve the efficacy of their mental healthcare internet-based interventions. This is especially beneficial as internet-based interventions to treat mental illness are fast becoming a norm in high income countries (Baumeister et al., 2014; Coull, & Morris, 2011; Griffith et al., 2010; Königbauer et al., 2017) and if South Africa were to follow suit its burden of mental illness could be alleviated.

The concept of depression and anxiety disorder internet-based interventions in South Africa is found to be a feasible and worthy endeavour. Certainly such interventions would need to be adjusted or developed with South Africa's needs in mind. Such adjustment or development should make use of the list of factors (section 6.7) emergent from this research in order to insure higher efficacy. These factors are: use of cognitive behavioural therapy (CBT) as main treatment method; at least eight weeks in duration; include therapist input and reminders; 20 minutes per participant per week; intervention must be low cost; use language of highest accessibility across South Africa; separate depression and anxiety interventions; be anonymous; include suicide screening; implemented in the public health care sector. Thus the second and last aim of this thesis was addressed.

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# APPENDICIES

## APPENDIX A: GENERAL SUMMARY OF REVIEWED STUDIES

Appendix 1																
Summary of systematically selected randomised controlled trials (RCTs) of internet intervention programmes results; (i) depression, (ii) anxiety, (iii) depression and anxiety.																
(i) Depression outcomes																
Study	Programme	Name	Type	Length (weeks)	Control		Human input		Participants		ITT analysis	Effective overall	Posttest Group or subgroup	Effect size difference(ESD) for control	Within ES	Long-term follow-up
					type	WLC	Therapist/ duration*	Reminder	No.†	Setting, recruitment method, age						
Berger et al. 2011	Deprexis	CBT	10	WLC	Yes/nr	Yes	76	Community; newspapers, television interview, and Deprexis website; mean age, 38.8 years	Yes	Yes	SS/G	1.14ITT, BDI	0.14 ITT	6 months	Yes	
Boiler et al. 2013	Psyfit	PP	8	WLC	No	No	284	Community newspapers and facebook; mean age, 43.2 years	Yes	Yes	SS/CSD	0.36 ITT, CES-D	0.16 ITT	6 months	Yes	
											G vs.UG	0.30 ITT, BDI				
											SS/CSD	0.32 ITT, HADS-A	0.05 ITT			
												0.35 C, CES-D	0.21 C			
												0.31 C, HADS-D	0.04 C			
Carlbriing et al. 2013	Depression- shjalpen	BA + ACT	8	WLC	Yes/94.8	No	80	Community; newspapers; mean age, 44.4 years	Yes	Yes	SS/CSD	0.64 ITT, MADRS-SR	1.17 ITT*	3 months	No	
												0.98 ITT, BDI-2	0.26 ITT*			
												0.45 ITT, BAI	0.22 ITT*			
Hoifodt et al. 2013	MoodGYM	CBT	6	WLC	Yes/nr	Yes	106	Primary care; waitlists of outpatient clinics; mean age, 36.1 years	Yes	Yes	CSD	0.65 ITT, BDI-2	0.65 ITT	6 months	Yes	
												0.08 ITT, BAI	0.35 ITT			
												1.10 ITT, HADS-D	0.11 ITT			
												0.74 ITT, HADS-A	0.13 ITT			
Lintvedt et al. 2013	MoodGYM BluePages	CBT	8	WLC	No	No	126	University, screening survey, mean age, 28.2 years.	Yes	Yes	SS/CSD	0.57 ITT, CES-D	0.26 ITT*	none		
												0.58 C, CES-D*	0.25 C*			
Strøm et al. 2013	none	PAF	9	WLC	Yes/nr	No	48	Community; online sites and one major newspaper; mean age, 49.2 years	Yes	Yes	SS/Dx	0.67 BDI-II, ITT	0.62 ITT	6 months	Yes	
												0.14 BDI, ITT	0.34 ITT			
												0.62 ITT, MADRS-S	0.58 ITT			



Summary of systematically selected randomised controlled trials (RCTs) of internet intervention programmes results; (i) depression, (ii) anxiety, (iii) depression and anxiety.															
(ii) Anxiety outcomes															
Programme		Human input			Participants			Posttest			Long-term follow-up				
Study	Name	Type	Length (weeks)	Control type	Therapist/ duration*	Reminder	No.†	Setting; recruitment method; age	ITT analysis	Effective overall	Group or subgroup	Effect size difference(ESD)	Within ES for control	Follow-up	Effective
Berger et al. 2014	none	Tailored CBT	8	WLC	Yes/mean of 12.6 messages	Yes	132	Multiple countries; newspapers and websites; mean age, 35.1 years	Yes	Yes	T A	0.84 ITT,BAI* 0.94 ITT,BAI* 0.84 ITT,BDI-2* 0.71 ITT,BDI-2*	0.37 ITT* 0.15 ITT*	6 months	Yes
Boettcher et al. 2012	none	AT	4	Placebo	No	No	68	Community; newspapers and internet forums; mean age: 38.3 years	Yes	No		0.02 ITT,SAC* 0.09 ITT,SPS* 0.03 ITT,SIAS* 0.21 ITT,LSAS* 0.14 ITT,BDI*	0.67 ITT 0.56 ITT 0.63 ITT 0.59 ITT 0.71 ITT	4 months	No
Carlbring et al. 2012	none	Cognitive Bias Modification	4	Placebo	No	Yes	79	Community; media and intervention website; mean age, 36.5 years	Yes	No	CSD/Dx	0.07 LSAS-SR 0.07 ITT,SPS* 0.05 ITT,SIAS* 0.10 ITT,BAI*	0.35 ITT* 0.24 ITT* 0.18 ITT* 0.29 ITT*	4 months	No

Summary of systematically selected randomised controlled trials (RCTs) of internet intervention programmes results; (i) depression, (ii) anxiety, (iii) depression and anxiety.															
(ii) Anxiety outcomes															
Study	Programme	Name	Type	Length (weeks)	Human input		Participants			Posttest		Long-term follow-up			
					Therapist/ duration*	Reminder	No.†	Setting; recruitment method; age	ITT analysis	Effective overall	Group or subgroup	Effect size difference(ESD)	Within ES for control	Follow-up	Effective
Christensen et al. 2014		Version of the e-couch programme	CBT & PE	10	No	Yes	558	National; randomly selected from Australian electoral roll; mean age, 25	Yes	Yes	A	0.06 ITT, GAD-7#	0.23 ITT*	6 months	Yes
											A/P	0.35 ITT, GAD-7#			
											A/E	0.22 ITT, GAD-7#		1 year	Yes
											C/P	0.1 ITT, GAD-7#			
											A	0.02 ITT, ASI#	0.02 ITT*		
											A/P	0.26 ITT, ASI#			
											A/E	0.23 ITT, ASI#			
											C/P	0.18 ITT, ASI#			
											A	0.14 ITT, CES-D#	0.12 ITT*		
											A/P	0.34 ITT, CES-D#			
											A/E	0.55 ITT, CES-D#			
											C/P	0.26 ITT, CES-D#			
Hedman et al. 2011		none	CBT	9	Yes/nr	Yes	80	Community; original study; mean age, 35.3	Yes	Yes	Dx	0.93 ITT, LSAS-SR#	0.03 ITT*	1 year	Yes
												0.88 ITT, SIAS#	0.01 ITT*	5 years	Yes
												0.97 ITT, SPS#	0.04 ITT*		
												0.70 ITT, MADRS-S*	0.06 ITT*		
												0.85 ITT, BAI#	0.09 ITT*		
Kok et al. 2014		Phobias Under Control	EP	5	Yes/nr	Yes	212	Waiting lists of outpatient clinics; mean age, 34.6 years	Yes	Yes	SS	0.34 ITT, CES-D	0.46 ITT	none	
												0.28 ITT, BAI	0.00 ITT		
												0.35 ITT, Fo	0.13 ITT		

Summary of systematically selected randomised controlled trials (RCTs) of internet intervention programmes results; (i) depression, (ii) anxiety, (iii) depression and anxiety.																
(ii) Anxiety outcomes																
Study	Programme	Name	Type	Length (weeks)	Human input		Participants		ITT analysis	Effective overall	Posttest		Long-term follow-up			
					Therapist/ duration*	Reminder	No.†	Setting; recruitment method; age			Group or subgroup	Effect size difference(ESD)		Within ES for control	Follow-up	
Paxling et al. 2011	none	Tailored	8	WLC	Yes/97	Yes	89	Community; newspaper and a website; mean age, 39.3 years	Yes	Yes	SS	1.11 ITT,PSWQ 1.07 ITT,GADQ 1.35 ITT,S-TAI-S 1.29 ITT,S-TAI-T 0.85 ITT,BAI 0.86 ITT,BDI 0.98 ITT,MADRS-SR	0.01 ITT* 0.18 ITT* 0.05 ITT* 0.14 ITT* 0.2 ITT* 0.03 ITT* 0.44 ITT*	1 year 3 years	Yes Yes	
Tillfors et al. 2011	none	CBT	9	WLC	Yes/nr	Yes	19	High schools; newspapers, school staff, advertisements in high schools; mean age, 16.5 years.	Yes	Yes	HSS	1.48 ITT,LSAS-SR Fear 1.13 ITT,LSAS-SR Avoidance 1.28 ITT,SPSG-C 1.39 ITT,MADRS-S 1.47 ITT,BAI	1.27 ITT* 0.42 ITT* 0.10 ITT* 0.07 ITT* 0.02 ITT*	1 year	Yes	
van Ballegoijen et al. 2013	Don't Panic Online	Based on CBT	6	WLC	Yes/1 to 2 hours per participant	Yes	126	Community; online newspaper, Facebook, newspapers; mean age, 36.6 years.	Yes	No	SS	0.30 ITT,PDSS-SR 0.39 ITT,BAI 0.39 ITT,CES-D	IDGC IDGC IDGC	none		

Summary of systematically selected randomised controlled trials (RCTs) of internet intervention programmes results; (i) depression, (ii) anxiety, (iii) depression and anxiety.														
Study	Programme	Name	Type	Length (weeks)	Human input		Participants		ITT analysis	Effective overall	Posttest Group or subgroup	Effect size difference(ESD)	Within ES for control	Long-term follow-up
					Therapist/duration*	Reminder	No.†	Setting; recruitment method; age						
Hoek et al. 2012	none	PS	5	WLC	No	No	45	Community; websites, magazines, schools, referrals by school-doctor, info to parents; mean age, 16.07 years	Yes	No	SS	0.06 ITT, CES-D#	0.66 ITT*	none
					therapeutic feedback							0.07 ITT, HADS-A*	0.58 ITT*	
Kleiboer et al. 2015	none	PS	6	WLC	Yes/25	No	537	Community; websites and newspapers; mean age, 44.5 years	Yes	Yes	NS	0.17 ITT, CES-D	0.56 ITT	none
											SR	0.22 ITT, CES-D		
											WS	0.34 ITT, CES-D		
											N-SS	0.12 ITT, CES-D		
											NS	0.23 ITT, HADS	0.34 ITT	
											SR	0.27 ITT, HADS		
											WS	0.3 ITT, HADS		
											N-SS	0.17 ITT, HADS		
											NS	0.01 ITT, BAI	0.38 ITT	
											SR	0.23 ITT, BAI		
											WS	0.05 ITT, BAI		
											N-SS	0.08 ITT, BAI		
											NS	0.04 C, CES-D	IDGC	
											SR	0.31 C, CES-D		
											WS	0.62 C, CES-D		
											N-SS	0.24 C, CES-D		
											NS	0.25 C, HADS	IDGC	
											SR	0.19 C, HADS		
											WS	0.58 C, HADS		
											N-SS	0.31 C, HADS		





APPENDIX B: ADDITIONAL SAMPLE CHARACTERISTICS OF REVIEWED STUDIES

Appendix 2

Additional sample characteristics of selected randomised controlled trials (RCTs) of internet intervention programmes; (i) depression, (ii) anxiety, (iii) depression and anxiety.

(i) Depression outcomes

Study	Gender	Education Level	Employed	Treatment History	Medication
Berger et al. 2011	F – 69.7% M – 30.3%	63.2% TE ¥	15% UE	61.8% PPH	75% NM
Boiler et al. 2013	F – 79.6% M – 20.4% ¥	73.2% TE	10.6% UE	nr	nr
Carlbring et al. 2013	F – 82.5% M – 17.5%	76.3% TE ¥	7.5% UE	nr	86.3% NM
Hoifodt et al. 2013	F – 72.6% M – 27.4%	52.8% TE ¥	4.7% UE	58.5% PPH	18.9% OM
Lintvedt et al. 2013	F – 76.7% M – 23.3%	100% TE ¥	nr	36.2% SPH	nr
Ström et al. 2013	F – 83.3% M – 16.7%	79.1% TE ¥	nr	62.5% PPH	14.6% OM
Unlu Ince et al. 2013	F – 59% M – 41% ¥	31% HE	nr	nr	nr
Vernmark et al. 2010	F – 70% M – 30%	81.8% TE ¥	10.2% UE	46.6% PPH	19.3% OM

Additional sample characteristics of selected randomised controlled trials (RCTs) of internet intervention programmes; (i) depression, (ii) anxiety, (iii) depression and anxiety.									
(ii) Anxiety outcomes									
Study	Gender	Education Level	Employed	Treatment History	Medication				
Berger et al. 2014	F – 56.1% M – 43.9%	59.9% TE ¥	18.2% UE	53% PPH	14.4% OM				
Boettcher et al. 2012	F – 36.76% ¥ M – 63.24% ¥	61.76% TE ¥	nr	41.18% PPH ¥	5.88% OM ¥				
Carbring et al. 2012	F – 68.4% M – 31.7%	nr	nr	nr	21.5% OM				
Christensen et al. 2014	F – 80.65% ¥ M – 19.35% ¥	29.1% CUO ¥	12.01% NLF ¥	nr	91.40% NM ¥				
Hedman et al. 2011	F – 70% M – 30% ¥	nr	nr	nr	MIC/Nnr				
Kok et al. 2014	F – 61% M – 59% ¥	57.1% TE	nr	100% PPH ¥	20% OM				
Paxling et al. 2011	F – 79.8% M – 20.2% ¥	nr	nr	nr	37.1% OM				
Tillfors et al. 2011	F – 89.47% ¥ M – 10.53% ¥	100% HSS ¥	nr	nr	MIC/Nnr				
van Ballegooijen et al. 2013	F – 67.5% M – 32.5% ¥	50% TE	nr	37.3% PPH	nr				

Additional sample characteristics of selected randomised controlled trials (RCTs) of internet intervention programmes; (i) depression, (ii) anxiety, (iii) depression and anxiety.									
(iii) Depression and anxiety outcomes									
Study	Gender	Education Level	Employed	Treatment History	Medication				
Hoek et al. 2012	F – 75.6% M – 24.4% ¥	31.1% HE	nr	15.2% MD 6.1% GAD 42.4% SP	nr				
Kleiboer et al. 2015	F – 65% M – 35%	58% HE	nr	nr	MIC/Nnr				
Proudfoot et al. 2013	F – 69.6% M – 29.4% ¥	nr	83.83% E ¥	MN/Nnr	MN/Nnr				
<p>CA = Culturally Adapted; CG = Control Group; CUO = Completed University Only; E = Employed; F = Female; GAD = General Anxiety Disorder; HE = High Education; HSS = High School Students; IG = Intervention Group; M = Male; MD = Major Depression; MIC = Mentioned in Inclusion Criteria; MN = Mentioned; NLF = Not in Labour Force; Nnr = Number not reported; nr = not reported; NM = No Medication; OM = On Medication; OT = Other Treatment; PPH = Positive for Past treatment History; SP = Social Phobia; SPH = Sought Professional Help; TE = Tertiary Education; U = Unemployed</p> <p>¥ Calculated from data given.</p> <p>Table adapted from Griffiths et al. (2010) for congruency.</p>									

## APPENDIX C: ETHICAL CONCERNS OF REVIEWED STUDIES

Appendix 3											
Salient ethical concerns of selected randomised controlled trials (RCTs) of internet intervention programmes: (i) depression, (ii) anxiety, (iii) depression and anxiety.											
Study	Funding Provider	Declaration Of Conflict	Inclusion & Exclusion		Adapted for Cross-Cultural Use	Attrition Rate		Screened For Suicide Risk	Approved By An Ethics Committee		
			Criteria Clearly Stated	Criteria Adhered To		Treatment(s) (RP/n/%) All ¥	Control(s) (RP/n/%) All ¥				
Berger et al. 2011	Swiss National Science Foundation & SRC	NM	Y	Y	N	GPT (25/25/0) UGPT (22/25/12) GFU (20/25/20) UGFU (19/25/24)	PT(22/26/15.84) FU(20/26/23.08)	Y	Y/UEC		
Boiler et al. 2013	Dutch Ministry of Health, Welfare and Sport	DC	Y	Y	N	PT (119/143/16.78) FU (109/143/23.78)	PT(95/141/32.64) FU(89/141/36.88)	Y	Y		
Carlbriing et al. 2013	SSF, SCSR & SCWLR	DC	Y	Y	N	PT (40/40/0) FU (37/40/7.5)	PT (38/40/5)	nr	Y/UEC		
Hoifodt et al. 2013	Research Council of Norway	DC	Y	Y	N	PT (37/52/28.85) FU (42/52/19.23)	PT (47/54/12.96) FU (34/54/37.04)	Y	Y/REC		
Lintvedt et al. 2013	undeclared	DC	Y	Y	N	PT (42/81/48.15)	PT (59/82/28.05)	nr	Y	UEC & REC	
Ström et al. 2013	SCWLSR, SRC & Professor's contract	DC	Y	Y	N	PT (24/24/0) FU (21/24/12.5)	PT (24/24/0)	Y	Y		
Unlu Ince et al. 2013	unclear	DNC	Y	Y	Y $\alpha = 0.87$ at baseline	PT (26/49/46.94) FU (13/49/73.47)	PT (30/47/36.17) FU (24/47/48.94)	Y	Y		
Vermmark et al. 2010	SRC	DC	Y	Y	N	ET PT (29/30/3.33) SH PT (27/29/6.90) ET FU (25/30/16.67) SHFU (26/29/10.34)	PT (29/29/0) FU(24/29/17.24)	Y	Y/REC	(Throughout for WLC)	

Salient ethical concerns of selected randomised controlled trials (RCTs) of internet intervention programmes; (i) depression, (ii) anxiety, (iii) depression and anxiety.											
(ii) Anxiety outcomes											
Study	Funding Provider	Declaration Of Conflict	Inclusion & Exclusion Criteria Clearly Stated	Inclusion & Exclusion Criteria Adhered To	Adapted for Cross-Cultural Use	Attrition Rate		Screened For Suicide Risk	Approved By An Ethics Committee		
						T treatment(s) (RP/n/%) All ¥	Control(s) (RP/n/%) All ¥				
Berger et al. 2014	SNSF	NM	Y	Y	N	T PT (40/44/9.09) DS PT (39/44/11.36) T FU (26/44/40.90) DS FU (30/44/31.81)	PT (40/44/9.09)	Y	Y/UEC		
Boettcher et al. 2012	undeclared	NM	Y	Y	N	PT (32/33/3.03) FU (23/33/30.30)	PT(32/35/8.57) FU(23/35/34.29)	Y	nr		
Carlbjörk et al. 2012	SCWLR	DC	Y	Y	N	PT (37/40/7.5) FU (37/40/7.5)	PT(39/39/0) FU(37/39/5.13)	Y	Y/REC		
Christensen et al. 2014	National Health and Medical Research Council	DC	Y	Y	N	AW PT (66/111/40.54) AW/P PT (75/110/31.81) AW/E PT (59/113/47.79) AW FU1 (55/111/50.45) AW/P FU1 (62/110/43.64) AW/E FU1 (52/113/53.98) AW FU2 (53/111/52.25) AW/P FU2 (52/110/52.72) AW/E FU2 (40/113/64.60)	CW PT (67/113/40.70) C/P PT (93/111/16.22) CW FU1 (55/113/51.33) C/P FU1 (77/111/30.63) CW FU2 (49/113/56.64) C/P FU2 (70/111/36.94)	Y	Y		
Hedman et al. 2011	Stockholm County Council	DNC	Y	Y	N	PT (39/40/2.5) FU (32/40/20)	PT(40/40/0) FU(32/40/20)	nr	Y		
Kok et al. 2014	ZonMw	DC	Y	Y	N	PT (56/105/46.67)	PT(72/107/32.71)	MSPNC	Y		
Paxling et al. 2011	SCWLR	NM	Y	Y	N	PT (38/44/13.64) FU1 (29/44/34.09) FU2 (26/44/40.90)	PT(44/45/2.22) FU2 (32/45/28.89)	Y	Y	(name not given)	
Tillfors et al. 2011	undeclared	NM	Y	Y	N	PT (9/10/10) FU (13/19/31.58)	PT(9/9/0)	Y	Y		



Salient ethical concerns of selected randomised controlled trials (RCTs) of internet intervention programmes; (i) depression, (ii) anxiety, (iii) depression and anxiety outcomes.									
Study	Funding Provider	Declaration Of Conflict	Inclusion & Exclusion Criteria Clearly Stated	Inclusion & Exclusion Criteria Adhered To	Adapted for Cross-Cultural Use	Attrition Rate		Screened For Suicide Risk	Approved By An Ethics Committee
						Treatment(s) (RP/n%) All ¥	Control(s) (RP/n%) All ¥		
Hoek et al. 2012	ZonMw	NM	Y	Y	N	PT (13/22/40.90) FU (11/22/50)	PT (15/23/34.78) FU (16/23/30.43)	Y	Y
Kleiboer et al. 2015	ZonMw	NM	Y	Y	N	UGPT (75/107/29.91) GRPT (82/108/24.07) WGPT (74/106/30.19) CSPT (97/110/11.82)	PT (93/106/12.26)	Y	Y/UEC
Proudfoot et al. 2013	Australian Government Department of Health and Ageing	DNC	Y	Y	N	PT (126/231/45.45) FU (100/231/56.71)	WLC PT (198/228/13.17) ACPT (195/246/20.73) ACFU (167/246/32.11)	Y	Y/UEC
<p>AC = Active Control; AW = Active Website; AW/E = Active Website with Email; AW/P = Active Website with Phone; CG = Control Group; CS = Chat Support; CW = Control Website; C/P = Control with Phone; DC = Declared Conflict present; DNC = Declared No Conflict; DS = Disorder Specific; DTTF = Dropouts Treated as Treated Failures; ET = Email Therapy; F = Female; G = Guided; GR = Guidance on Request; IG = Intervention Group; M = Male; ME = Mentioned Elsewhere; MSPNC = Mentions Screening but Procedure Not made Clear; n = sample number at randomisation; N = No; NM = Not Mentioned; REC = Regional Ethics Committee; RP = Remaining Participants; SCSR = Swedish Council for Swedish Research; SCWLR = Swedish Council for Work Life Research; SCWLSR = Swedish Council for Working Life and Social Research; SH = Self-Help; SNSF = Swiss National Science Foundation; SRC = Swedish Research Council; SSF = Swedish Science Foundation; T = Tailored; UEC = University Ethics Committee; UG = Unguided; WG = Weekly Guidance; WLC = Wait List Control; Y = Yes</p>									
¥ Calculated from data given.									
Table adapted from Griffiths et al. (2010) for congruency.									

APPENDIX D: LISTED IN COCHRANE CENTRAL REGISTER OF CONTROLLED TRIALS (NOT ACCESSED)

1	
Publication year: 2013	Author: Titov, N
Title:	A randomized controlled trial of the effects of guided internet -treatment vs. self-guided internet -treatment with pre-treatment contact vs. purely self-guided internet -delivered treatment on symptoms of anxiety and depression in Australian older adults (60+)
2	
Publication Year: 2012	Unknown
Title	Is internet -delivered treatment specifically for symptoms of social phobia as effective as internet -delivered treatment for symptoms of both anxiety and depression, and are self-guided versions of these as effective as therapist-guided versions?
3	
Publication Year: 2011	Unknown
Title	A Randomised Controlled Trial Comparing Internet Based Cognitive Behavioural Therapy for Major Depressive Disorder Plus a Cognitive Bias Modification Intervention (OxIGen) vs. Internet Based Cognitive Behavioural Therapy for Major Depressive Disorder vs. a Waitlist Control on Symptoms of Depression and Negative Interpretation Bias
4	
Publication Year: 2013	Author: Williams, A
Title	A randomised controlled trial comparing Internet based cognitive bias modification (Active version) for obsessive compulsive disorder vs. Internet based cognitive bias modification (Control version) on negative interpretation bias
5	
Publication Year: 2012	Author: Christensen H
Title	A pilot study to investigate the feasibility of a web -based self-help program to reduce suicidal thoughts in community members with suicidal thoughts
6	
Publication Year: 2011	Author: Unknown
Title:	Role of Self Monitoring in Combination With Proactive Web -based Management in the Treatment of Hypertension: a Randomized Controlled Trial
7	
Publication Year: 2013	Author: van Spijker, B
Title:	A randomised controlled trial comparing a web -based self-help program to reduce suicide ideation with an attention matched control program in community members with suicide ideation
8	
Publication Year 2012	Author: Tudor, TB
Title	Internet Treatment for Social Phobia: A Randomized Controlled Trial
9	
Publication Year 2012	Author: Unknown
Title:	Internet -based treatment for obsessive-compulsive disorder – acceptance and effectiveness
10	



Publication Year: 2011		Author: Unknown
Title	In patients seeking treatment for social phobia internet cognitive behaviour therapy will be compared with face to face cognitive behaviour therapy on the reduction in social phobia scores	
11		
Publication Year: 2011		Author: Unknown
Title	Internet -based cognitive-behavioural therapy for Obsessive-Compulsive Disorder	
12		
Publication Year: 2012		Author: Unknown
Title	Reduction of Social Phobia Symptoms With Combined Internet -Based Cognitive Bias Modification and Cognitive Behavioral Therapy	
13		
Publication Year: 2013		Author: Unknown
Title	A Randomised Controlled Trial Comparing Internet Based Cognitive Behavioural Therapy for Major Depressive Disorder Plus a Cognitive Bias Modification Intervention (OxIGen) on Symptoms of Depression and Negative Interpretation Bias	
14		
Publication Year: 2014		Author: Andersson, G
Title	Internet -delivered Psychodynamic Therapy for Social Anxiety Disorder: A Randomized Controlled Trial	
15		
Publication Year: 2012		Author: Titov, N
Title	A randomized controlled trial of the effects of disorder-specific vs. trans-diagnostic and self-guided vs. guided Internet -administered treatment on symptoms of depression in Australian adults	
16		
Publication Year: 2011		Author: Knaevelsrud, C and Wagner, B
Title	Internet -based writing therapy to reduce posttraumatic stress and depression symptoms in Arabic-speaking clients	
17		
Publication Year: 2011		Author: Unknown
Title	Internet -based Cognitive Behavior Therapy for Obsessive Compulsive Disorder: A Randomized Controlled Trial	
18		
Publication Year: 2011		Author: Andersson, G
Title	Psychodynamic Internet Treatment Versus Cognitive Behavioral Therapy (CBT) for Generalized Anxiety Disorder	
19		
Publication Year: 2010		Author: Carlbring, P
Title	Functional Magnetic Resonance Imaging (fMRI) and Treatment of Social Phobia Over the Internet : Cognitive Behavioural Therapy (CBT) Versus Computerized Attention Training and the Possible Effect of Genetic Variation.	
20		
Publication Year: 2013		Author: Unknown
Title	Substance-use Focused Screening and Brief Intervention as a Complement to Internet -based Psychiatric Treatment for Depression, Panic Disorder or Social Phobia: A Randomized Controlled Trial (eScreeniPsy)	
21		
Publication Year: 2011		Author: Carlbring, P, Andersson, G and

	Nordgren, LB
Title	Internet -administrated treatment of anxiety disorders (NOVA II)
22	
Publication Year: 2011	Author: Unknown
Title	A randomised controlled trial of a clinician-guided education program for Obsessive Compulsive Disorder comparing the efficacy of administration via the Internet with administration via Bibliotherapy
23	
Publication Year: 2012	Author: Unknown
Title	Efficacy of an Internet -based Booster Program for Obsessive-compulsive Disorder: A Randomized Controlled Trial
24	
Publication Year: 2011	Author: Unknown
Title	A randomized controlled trial of Internet based education for social phobia, panic disorder (with or without agoraphobia), and generalised anxiety disorder, comparing immediate education versus delayed education groups on severity of symptoms of anxiety
25	
Publication Year: 2013	Author: Titov, N
Title	A randomized controlled trial of the effects of self-guided vs. guided Internet -administered treatment on symptoms of anxiety and depression in Australian young adults (18-24)
26	
Publication Year: 2013	Author: Linder, P
Title	Guided and Unguided CBT for Social Anxiety Disorder and/or Panic Disorder Via the Internet and a Smartphone Application
27	
Publication Year: 2013	Author: Unknown
Title	Adaptation of a U.S. Internet Tool to Prevent Depression and Addiction in Hong Kong Adolescents
28	
Publication Year: 2013	Author: Unknown
Title	Internet -delivered Attention Training for Obsessive-Compulsive Disorder
29	
Publication Year: 2014	Author: Serlachius, E
Title	Internet -delivered Cognitive Behavior Therapy for Adolescents With Obsessive-Compulsive Disorder: A Randomized Controlled Study
30	
Publication Year: 2012	Author: Clark, DM
Title	A randomised controlled trial of internet -based cognitive therapy (iCT) and standard cognitive therapy (CT) for social anxiety disorder
31	
Publication Year: 2012	Author: Berger, M
Title	Internet -based treatment for obsessive-compulsive disorder – acceptance and effectiveness
32	
Publication Year: 2012	Author: Unknown
Title	Reduction of Social Phobia Symptoms With Internet -Based Cognitive Bias Modification

33	
Publication Year: 2011	Author: Knaevelsrud, C
Title	Effects of an Internet -based Intervention for Posttraumatic Stress Disorder
34	
Publication Year: 2012	Author: Rück, C
Title	Internet -based Cognitive Behavior Therapy in Combination With D-Cycloserine for Obsessive Compulsive Disorder: A Double Blinded Randomized Controlled Trial
35	
Publication Year: 2012	Author: Andrews, G
Title	A randomised controlled trial comparing clinician-assisted Internet based treatment for Obsessive Compulsive Disorder (OCD) vs. a waitlist control condition on severity of symptoms of OCD
36	
Publication Year: 2012	Author: Andrews G
Title	A randomised controlled trial comparing clinician-assisted Internet based treatment for Obsessive Compulsive Disorder (OCD) vs. face to face treatment of OCD
37	
Publication Year: 2014	Author: Ciuca, A and Crisan, LG
Title	PAXonline: A Randomized Controlled Trial Comparing the Efficacy of an Internet -Based Cognitive Behavior Intervention, delivered with or without assistance from a therapist, to waiting-list in Romanian adults with Panic Disorder