

ALTERNATIVE INTERVENTIONS FOR YOUNG MEN'S MENTAL  
HEALTH

by

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I hereby certify that this material, which I now submit for assessment on the programme of study leading to the award of DOCTOR OF PHILOSOPHY is entirely my own work, that I exercised reasonable care to ensure that the work is original, and does not to the best of my knowledge breach any law of copyright, and has not been taken from the work of others save and to the extent that such work has been cited and acknowledged within the text of my work.

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PUBLICATIONS AND PRESENTATIONS PERTAINING TO THIS THESIS

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## ABSTRACT

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The main aim of this thesis was to explore the effectiveness and acceptability of alternative interventions for facilitating help-seeking and improving the mental health of young adult males. Based on recommendations for innovative ways to develop interventions that facilitate mental health help-seeking specific to men (Addis & Mahalik, 2003), the interventions employed in this thesis integrate exercise and psychotherapeutic strategies, and make use of sport as a vehicle for mental health promotion. Findings from the Randomised Controlled Trial (RCT) comprising study 1 provided support for a team-sport/psychosocial intervention (Back of the Net; BTN programme) for improving depressive symptoms among men. Employing qualitative methodology, study 2 explored men's perceptions and experiences of receipt, implementation and acceptability of the BTN programme. Findings from this process evaluation reported positively on the use of sport as a vehicle for accessing and engaging men in a mental health intervention. The RCT employed in study 3 found that the combined strategies of exercise and a sports-based psychotherapeutic intervention delivered via the internet were not beneficial for mental health beyond the effects of exercise alone. Thus, the studies comprising this thesis further provide both quantitative and qualitative evidence in support of the effectiveness of exercise for improving mental health. With respect to the therapeutic processes that may mediate the antidepressant effect of exercise, study 4 reports on exercise self-efficacy, physical self-concept and global self-esteem as potential mechanisms of change. Temporal findings from study 4 suggest that these psychosocial mechanisms may be important factors associated with the effect of exercise on depression. Overall, the findings from this thesis advance our understanding of the effectiveness and acceptability of exercise and CBT-based interventions delivered within the context of sport for young men's mental health.

# **CHAPTER 1**

## **LITERATURE REVIEW**

Mental health is at the foundation of overall well-being and effective functioning for each individual and their wider community (World Health Organisation; WHO, 2005). Positive mental health is described as a positive sense of well-being inclusive of self-esteem, optimism, sense of mastery and coherence, satisfying personal relationships and resilience or the ability to cope with adversities (Lavikainen, Lahtinen & Lehtinen, 2000). The promotion of positive mental health is concerned with the enhancement of well-being among the general population (WHO, 2005). Specifically, mental health promotion aims to increase emotional resilience through interventions designed to promote self-esteem and coping skills, increase social inclusion within communities, and reduce barriers to help-seeking (WHO, 2005). Policy recommendations state that mental health promotion should be targeted at the community level and focus on early intervention strategies in an attempt to protect against the escalation of distress (Department of Health & Children; DoHC, 2006, 2008; Health Service Executive, 2005; Richardson & Carroll, 2009; WHO, 2005). Recent mental health policies (e.g., Irish National Strategy for Action on Suicide Prevention, 2005; Men's Health around the World, 2009; National Men's Mental Health Policy, 2008) further recommend that the promotion of positive mental health requires a targeted approach that is sensitive to gender-specific patterns of help-seeking.

A significant body of research has shown that the propensity to seek professional help for health concerns differs by gender (Addis & Mahalik, 2003; Kessler, Brown & Broman, 1981; Mahalik, Good & Englar-Carlson, 2003; Weissman & Klerman, 1977). This gender disparity is particularly salient in the psychosocial and clinical psychology literature with men demonstrating more negative attitudes and behaviours towards seeking professional help for emotional and psychological difficulties than women (Addis & Mahalik, 2003; Moller-Leimkuhler, 2002). For

example, females with minor mental health problems report more positive attitudes towards help-seeking, either from lay or professional sources of help, than do men (Oliver, Pearson, Coe & Gunnell, 2005; Ward, Tedstone Doherty & Moran, 2007). Women also seek help for mental distress at a much higher rate than men with comparable difficulties (Biddle, Gunnell, Sharp & Donovan, 2004; Kessler et al., 1981; Oliver et al., 2005).

Age-related differences in help-seeking behaviour amongst men are also evident. Specifically, young adult men display more unfavourable attitudes towards seeking psychological help and are less likely to approach professional services for general mental health problems than are older men (Berger, Levant, McMillan, Kellher & Sellers, 2005; Biddle et al., 2004; Oliver et al., 2005; Russell, Gaffney, Collins, Bergin & Bedford, 2004). A particularly pertinent finding within the help-seeking literature is that young adult men neglect to seek support from either lay or professional avenues unless they are severely distressed (Biddle et al., 2004). Reluctance to seek help for minor mental health difficulties can often result in exacerbated symptom severity and a need for more intensive treatment (Kessler et al., 1981; Smith, Tran & Thompson, 2008; Tedstone Doherty & Kartalova-O'Doherty, 2010). This certainly appears to be the case in Ireland and the United Kingdom (UK) with population studies indicating that approximately 12% of men at any given time are experiencing levels of psychological distress serious enough to require treatment (Mental Health Foundation, 2005; Tedstone Doherty, Moran & Kartalova-O'Doherty, 2008). In addition, Irish population research reports that men are among those least willing to disclose distressing personal information to others (Ward, Tedstone-Doherty & Moran, 2007). It is evident that young men's reluctance to help-seek stands in contrast with their experiences of psychological distress and that this has the potential to increase the risk for experiencing

more severe difficulties. Consistent with this, community-based research has highlighted young adult men as the demographic most in need of interventions aimed at the promotion of positive mental health and help-seeking (Richardson & Carroll, 2009; Russell et al., 2004; Tedstone Doherty & Kartalova-O'Doherty, 2010; Ward et al., 2007). Men's negative attitudes and fears regarding mental health services, masculine gender-role socialisation and experiences of stigma have been presented as explanations for the discrepancy observed between help-seeking and the need for support among young adult men (Addis & Mahalik, 2003; Burke & McKeon, 2007; Corrigan, 2004; Moller-Leimkuhler, 2002; Smith et al., 2008; Vogel & Wade, 2009). Each of these factors will be discussed in turn.

#### *Negative Attitudes and Fears Regarding Mental Health Services*

Consistently, research has shown that the specific attitudes young men hold towards seeking help from existing professional mental health services impedes on their help-seeking behaviour (Good, Dell & Mintz, 1989; Oliver et al., 2005; Rickwood, Deane & Wilson, 2007). Ajzen's Theory of Planned Behaviour (TPB; 1991) proffers a model for understanding how negative attitudes towards mental health services prevent men from engaging with these services (Smith et al., 2008). The TPB suggests that intention to engage in health-related behaviour is determined by attitudes, subjective norms, and perceived behavioural control. According to Ajzen (1991), *attitudes* reflect the degree to which an individual evaluates a particular behaviour as favourable or unfavourable, subjective norms are related to perceived social pressures to perform or not perform a given behaviour, and perceived behavioural control is based on perceptions of difficulty in performing that behaviour. Empirical research has provided support for the TPB in predicting a wide range of behaviours (Armitage & Conner, 2001). Specifically, it has been suggested that the most critical predictor of one's

intention to engage in psychological help-seeking is the attitudes one holds (Skogstad, Deane & Spicer, 2006).

Young adult men commonly report negative attitudes such as perceiving their problems to be untreatable and dislike of talking to strangers about emotional difficulties (Begley, Chambers, Corcoran & Gallagher, 2003; Tedstone Doherty et al., 2008). Within Ireland, young males are particularly dissatisfied with available professional mental health services which are perceived as inaccessible and generally unacceptable (Russell et al., 2004). Young adult men also report being distrustful of and having no confidence in health professionals (Begley et al., 2003; Russell et al., 2004). Such discontented attitudes extend to include fears about breaches of confidentiality and concerns regarding anonymity which further act as barriers to help-seeking (Begley et al., 2003; Burke & McKeon, 2007; Rickwood et al., 2007; Russell et al., 2004).

#### *Masculine Gender-Role Socialisation*

Addis and Mahalik (2003) contend that male help-seeking behaviour is a product of masculine gender-role socialisation. Gender-role socialisation is based on the assumption that men and women learn attitudes and behaviours about what it means to be male and female from societal norms and ideologies. Within western culture traditional beliefs about what it means to be a man (e.g., seek power and control, be autonomous, self-reliant, strong and emotionally restrictive) appear intuitively antithetical to the behaviour of seeking psychological help and engaging in a therapeutic relationship (Courteney, 2000; Good et al., 1989). Successful help-seeking implies a loss of independence and control, reliance on others, and emotional awareness and vulnerability (Good et al., 1989; Good & Wood, 1995; Moller-Leimkuhler, 2002). Two overlapping theories on masculine gender-role socialisation have been presented to

account for men's reluctance to help-seek for mental health concerns: masculine ideology and masculine gender-role conflict.

*Masculine Ideology.* Traditional masculine ideology encapsulates the degree of endorsement and internalisation of culturally-constructed ideologies and beliefs of the traditional male role in society (Addis & Mahalik, 2003). Masculine ideologies are learned by means of socialisation processes and serve as guides for what constitutes acceptable male behaviour (Addis & Mahalik, 2003; Cochran & Rabinowitz, 2003; Smith et al., 2008). Research has shown that strongly endorsing traditional ideologies of the male role in society has detrimental effects on men's help-seeking for mental health concerns (Good et al., 1989; Good & Wood, 1995). For example, findings from a number of cross-sectional studies reveal that young men who endorse traditional masculine ideologies (i.e., view the male role as autonomous and power-seeking) hold significantly more negative attitudes toward psychological help-seeking and report poorer past help-seeking behaviours (Good et al., 1989; Berger et al., 2005; Smith et al., 2008). Utilising the TPB, Smith, Tran & Thompson (2008) report that it is these negative attitudes expressed by men that helps mediate the relationship between traditional masculine ideology and intentions to seek help for mental health concerns. Interestingly, research has shown that young men are more likely than older men to endorse masculinity ideologies (Levant & Fischer, 1998) which may partially explain the detrimental help-seeking behaviours specific to young adult men.

*Masculine Gender Role Conflict.* Masculine gender-role conflict refers to the specific negative consequences that men experience as a result of endorsing rigid or overly restrictive traditional masculine ideologies (O'Neil, Helms, Gable, David & Wrightsman, 1986). Examples of gender-role conflict include emotional stoicism, aggression in the absence of other coping styles, competitive power-seeking to the

detriment of others, and restrictive affectionate behaviour with other men (Addis & Mahalik, 2003; Wester, Christian, Vogel & Wei, 2007). In addition to endorsing masculine ideology, men's experiences of gender-role conflict have been shown to be significantly related to their negative attitudes towards seeking professional help for mental distress, past help-seeking behaviour and likelihood of future help-seeking behaviour (Good et al., 1989; Good & Wood, 1995).

### *Stigma*

One of the most significant barriers to professional help-seeking for mental distress is concern about stigma (Begley et al., 2003; Corrigan, 2004; Jorm, 2000; Vogel & Wade, 2009; Vogel, Wade & Hackler, 2007). Research has shown that stigma is associated with both having a mental health problem *and* the act of seeking professional help for mental health issues (Corrigan, 2004; Vogel, Wade & Haake, 2006). Corrigan (2004) contends that there are two separate types of stigma associated with help-seeking for mental health difficulties, namely, public stigma and self-stigma.

Public stigma is the perception held by society that individuals who seek psychological help are different, dangerous or socially unacceptable (Vogel et al., 2006). In scenario-based research, individuals described as seeking treatment for depression were rated less positively and more emotionally unstable than those described as not seeking help for depressive symptoms (Ben-Porath, 2002). Consistent with research that suggests people are less likely to seek help for issues that are viewed negatively by others (e.g., Overbeck, 1977) public stigma has been shown to deter individuals from seeking help for mental distress (Corrigan, 2004). Research has shown that the public stigma associated with help-seeking for minor mental health difficulties exerts a negative influence on attitudes and behaviours towards seeking help (Barney, Griffiths, Jorm & Christensen, 2006; Jorm & Wright, 2008; Vogel et al., 2007).



More recently, research has shown that self-stigma has a more direct effect on help-seeking behaviour than do public forms of stigma (Vogel & Wade, 2009). Self-stigma occurs when an individual experiences a threat to their self-worth as a result of internalising negative stigmatising beliefs such as perceiving themselves as weak or unacceptable (Corrigan, 2004; Vogel & Wade, 2009; Vogel et al., 2007). According to Vogel, Wade and Haake (2006) this internal form of stigma is directly related to psychological help-seeking attitudes and, in turn, willingness to seek help. To protect oneself from threats to self-worth an individual will avoid seeking professional help for mental health problems (Vogel et al., 2006; Vogel & Wade, 2009; Vogel, Shechtman & Wade, 2010). Research suggests that experiences of self-stigma associated with help-seeking are most pronounced for minor mental health difficulties where the individual perceives the need for formal support as voluntary rather than mandatory (Vogel & Wade, 2009).

It has been suggested that, as a result of cultural and gender-role norms, men are more susceptible than women to feelings of public and self-stigma surrounding mental health difficulties (Vogel et al., 2007). Specifically, males that ascribe to traditional masculine ideology are more likely to perceive public stigma and internalise the negative stigmatised beliefs surrounding professional help-seeking (Tedstone Doherty & Kartalova-O'Doherty, 2010; Vogel et al., 2007; Vogel & Wade, 2009). This is consistent with Smith, Tran and Thompson's (2008) contention that the relationship between masculine ideology and help-seeking behaviour is mediated by attitudes towards help-seeking which may reflect the extent to which an individual experiences self-stigma. Findings from a recent Irish national survey of help-seeking behaviour support the proposition that men may be more susceptible to stigma surrounding seeking help for mental health problems. Tedstone Doherty and Kartalova-O'Doherty

(2010) reported that stigma influenced help-seeking rather strongly for males but not for females. Qualitative research examining male experiences of mental health help-seeking further describe anticipated embarrassment, feelings of shame and experiences of stigma associated with mental health difficulties as central to discouraging men from seeking professional help (Begley et al., 2003).

### *The Need for Alternative Mental Health Interventions for Young Men*

Currently, young adult males are experiencing minor levels of mental distress but feel discouraged from accessing formal mental health support services (Oliver et al., 2005; Tedstone Doherty et al., 2008; Tedstone Doherty & Kartalova-O'Doherty, 2010). Failure to seek support for mental health difficulties can result the escalation of minor problems and as such, there is a need to develop innovative community-based programmes that promote coping strategies among men (Tedstone Doherty et al., 2008). Health promotion research proposes that mental health interventions should be delivered within a stepped care framework, which advocates the provision of evidence based treatments tailored to individual needs (NICE, 2009). The interventions in the stepped care model range from low to high intensity; it is recommended that low intensity psychosocial interventions are provided for individuals experiencing minor mental distress and more intensive interventions are required for those with severe difficulties.

With regard to developing low-intensity interventions specific to young men, recommendations suggest that research should focus on reducing barriers to help-seeking for young men and evaluate alternative, non-traditional and more informal sources of support that both serve to improve mental health and facilitate help-seeking behaviour (Addis & Mahalik, 2003; Begley et al., 2003; Biddle et al., 2004; DoHC,

2006). Specifically, Addis and Mahalik (2003) suggest that we need to change the *context* of mental health help-seeking so that the therapeutic environment is congruent with masculine attitudes. Contexts that (i) provide opportunities for reciprocity, (ii) focus on problem-solving rather than emotional expressiveness, and (iii) help maintain a sense of autonomy and control are more likely to have a positive effect on men's attitudes and behaviours towards help-seeking (Addis & Mahalik, 2003; Cochran & Rabinowitz, 2003; Good & Wood, 1995; Smith et al., 2008). For instance, by bringing groups of males together in unconventional therapy formats men can be facilitated to both receive support and reciprocate support to other men. Such opportunities for problem sharing preserve men's need for control by avoiding indebtedness and demonstrating competence (Addis & Mahalik, 2003; DoHC, 2006; Smith et al., 2008). It has further been suggested that mental health interventions aimed at men should normalize the therapeutic process in such a way that young males do not feel stigmatised or embarrassed for seeking help (Addis & Mahalik, 2003; Tedstone Doherty & Kartalova-O'Doherty, 2010; Vogel & Wade, 2009).

#### *Sport as a Vehicle for Mental Health Promotion*

Following from Addis and Mahalik's (2003) recommendations for contextual changes to the therapeutic environment, there is growing evidence that the context of *sport* can be utilised to facilitate help-seeking among men (e.g., Pringle & Sayers, 2004). The context of sport addresses many of the barriers to help-seeking experienced by men. Sports settings are attractive, easily accessible and do not carry the stigma or fears associated with traditional mental health services. As such, sporting environments present the opportunity to normalise the process of help-seeking amongst men. Research suggests that young men should be approached about health promotion in

environments where they feel comfortable (Burke & McKeon, 2007; Pringle & Sayers, 2004). It is believed that community-based sports programmes provide this opportunity by allowing support services to be brought to this difficult to engage demographic (Begley et al., 2003; Rickwood, Deane, Wilson & Ciarrochi, 2005; Russell et al., 2004).

While the use of sports as a vehicle for positive mental health promotion is a new concept (Pringle, 2009), research has shown that the environment of sport, in particular, football, can be successfully utilised to both engage young men in help-seeking behaviours and to actively promote coping strategies aimed at improving men's mental health (O'Kane & McKenna, 2002; Pringle & Sayers, 2004). For example, the 'It's a Goal!' project (Pringle & Sayers, 2004) based a community psychiatric nursing service within a UK football league stadium with the aim to promote strategies for developing good mental health among men at increased risk for depression. This project made use of the football club venue in addition to football terminology and metaphors to specifically target young males and explore mental health issues with this demographic. For instance, video clips of footballing legends and football stories were employed to stimulate group discussion; participants were encouraged to explore events that happened in high-profile games and match them to situations in their own lives. Qualitative evaluation of the 'It's a Goal!' programme demonstrated that by basing a group psycho-educational programme within the grounds of a football stadium and by employing the shared language of football, young adult men displayed positive attitudes towards, and, were willing to engage with informal mental health services (Pringle & Sayers, 2004). Participants who completed the 'It's a Goal!' project further expressed that the programme played a significant role in enabling them to take control of their own mental health (Edwards, Clifford & Campling, 2006). Using the language and terminology of football provided an opportunity for reciprocity; men discussed mental

health issues including depression, self-esteem and suicide in a way that was accessible, attractive and non-threatening (Edwards et al., 2006; Pringle & Sayers, 2004). This is consistent with anecdotal evidence supporting the idea that football as a metaphor for living can be used to engage clients with psychotherapy for more severe mental health problems (Clark, 2009).

Football is increasingly being utilised for the promotion of mental health and in the delivery of interventions that impact positively on men's mental health (Pringle, 2009). Within the UK, the charitable organisation Football Foundation in collaboration with the Premier League, the Football Association, the UK Government and Sport England is responsible for a number of initiatives designed to reduce stigma and discrimination experienced by people suffering from mental health problems. One such initiative, the 'Care Standards Improvement Programme' (CSIP) brings together mental health service users from across the UK to play in an annual small-sided football league. Qualitative evaluation conducted by McElroy, Evans and Pringle (2008) supports the role of the CSIP programme in benefiting mental health, most notably by improving feelings of inclusion and social support among the players. Other successful community-based programmes that employ the use of football and sports aimed at improving men's mental and physical health include 'Premier League Health' and 'Bristol Active for Life Project'.

Research has only recently begun to consider the utility of sports programmes in engaging young men in help-seeking behaviours. Conventionally, sports activities have proven to be attractive to young adults for a range of implicit and explicit motives (Kilpatrick, Hebert & Bartholomew, 2005). Specifically, young men view enjoyment as a central motivator for engaging in sports (Kilpatrick et al., 2005). Similarly, engagement in sports provides opportunities for competition and challenge, social

interaction and skills building, and sense of achievement, as well as a number of physical health related benefits (Fox, Boucher, Faulkner & Biddle, 2000; Kilpatrick et al., 2005).

The use of sports programmes and sporting language in mental health promotion is certainly promising; however, there is currently a need for more robust evidence in support of its effectiveness (Pringle, 2009). A central aim of this thesis was to utilise the context and language of sport to engage young men with positive mental health promotion. Specifically, study one (*chapter 2*) made use of football metaphors and five-a-side football training sessions to promote strategies for developing mental health among men and study three (*chapter 4*) utilised sporting video clips and the language and terminology of sport to engage men with mental health promotion. Qualitative evaluation of men's experiences of sport as a context for mental health promotion is provided in study two (*chapter 3*).

### *Exercise and Mental Health Promotion*

Findings from several narrative and meta-analytic reviews provide support for the role that exercise can play in the promotion of positive mental health (Blumenthal et al., 1999; Callaghan, 2004; Fox, 1999; Martinsen, 1994; McDonald & Hodgdon, 1991; Mead et al., 2009; Mutrie & Biddle, 1995; Scully, Kremer, Meade, Graham & Dudgeon, 1998). Literature from physical activity psychology has tended to focus on the beneficial effects of exercise on stress, anxiety, mood, self-esteem, and depression among both community and clinical populations (Biddle, Fox & Boucher, 2000). Specifically, exercise training has consistently been found to reduce trait anxiety and physiological reactivity to stressors (McDonald & Hodgdon, 1991; Taylor, 2000). Meta-analytic evidence presented by Biddle (2000) reports that participating in aerobic

exercise has a small-to-moderate positive effect on distinct mood states including tension, fatigue, confusion and anger. Exercise has further been shown to have a positive effect on physical self-perceptions and it is argued that these benefits generalise to improvements in overall self-concept in those who are initially low in self-esteem (Fox, 2000). Above all, the case for exercise as an effective therapy for the prevention and treatment of mild to clinical levels of depression is compelling (Dunn, Trivedi & O'Neal, 2001; Lawlor & Hopker, 2001; Mutrie, 2000; Teychene, Ball & Salmon, 2008).

### *Exercise and Depression*

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association APA, 2000) symptoms of depression manifest as feelings of sadness, loneliness, irritability, worthlessness, hopelessness, agitation, guilt and a range of physical symptoms. At the population level, depressive symptoms are viewed as a continuum that necessitates different levels of support at various stages (DoHC, 2006; Tedstone Doherty et al., 2008; WHO, 2003). Between 5 and 12% of men are at some point during their lives diagnosed with clinical depression requiring treatment from mental health professionals and between 10 and 16% of men experience milder transient symptoms of distress requiring community-based informal support (APA, 2000; DoHC, 2006; WHO, 2001). Growing evidence supports the potential of exercise interventions in both the management of clinically depressed patients and in treatment and prevention of mental distress in the general population (Blumenthal & Ong, 2009; Fox, 1999; Mead et al., 2009; North, McCullagh & Tran, 1990; Rethorst, Wipfli & Landers, 2009). A large meta-analytic review has found that compared to no treatment, exercise exerts a moderate-to-strong effect on depressive symptoms (Mead et al., 2009). In this recent review, exercise was shown to improve

symptoms of depression to a similar extent to established treatments including psychotherapy and antidepressants. However, the authors caution that many studies in this area are limited by methodological considerations, most notably, failure to employ intent-to-treat analysis (Mead et al., 2009).

In terms of a dose-response relationship between exercise and depression it has been recommended that aerobic exercise conducted at moderate intensity (i.e., consistent with public health recommendations) is effective for benefiting mild to moderate depression (Dunn, Trivedi, Kampert, Clark & Chambliss, 2005; Hansen, Stevens & Coast, 2001). In their sample of moderately depressed adults, Dunn and colleagues (2005) found no difference in depression scores in participants who exercised 3 days per week compared to those who exercised 5 days per week. The findings from this randomised control trial suggest that total energy expenditure rather than frequency of exercise sessions is the determining factor for reducing symptoms of depression (Dunn et al., 2005). However, recent meta-analytic findings (e.g., Rethorst et al., 2009) have failed to find support for a relationship between energy expenditure and change in depression, highlighting the need for further research in this area. There is empirical support for the effectiveness of various types of exercise for benefiting symptoms of depression of mild to moderate severity, however, the most consistent results have been observed for combined aerobic and resistant training (Craft & Landers, 1998; Dunn et al., 2001; Martinsen, 1994; Mutrie, 2000; Rethorst et al., 2009). With respect to the effect of intervention duration on change in depression, the meta-analysis of randomised control trials recently conducted by Rethorst and colleagues (2009) revealed that exercise interventions lasting between 4 and 16 weeks had a significantly greater effect on depressive symptoms compared to interventions lasting longer than 16 weeks. In addition to these findings, there is increasing evidence that



exercise is a valuable treatment for depression over short-term periods (Knubben et al., 2007; White, Kendrick & Yardley, 2009). Knubben and associates (2007) compared the effects of a 10-day endurance training programme on severity of depressive symptoms in patients with major depression with a placebo exercise group. Findings revealed that participants in the endurance exercise group experienced a significantly greater reduction in depression symptoms compared to those in the placebo condition, indicating that acute bouts of exercise can be beneficial for depression (Knubben et al., 2007). Furthermore, significant reductions in depression have been found for exercise programmes conducted indoors (Blumenthal et al., 1999; Dunn et al., 2005), outdoors (McNeil, LeBlanc & Joyner, 1991), supervised (Dunn et al., 2002), unsupervised (Blumenthal et al., 2007; White et al., 2009), using individual training programmes (Dunn et al., 2005; Hansen et al., 2001) and group exercise activities (Mather et al., 2002).

UK government guidelines recommend that supervised and structured exercise programmes lasting 45 to 60 minutes for up to three sessions per week for between 10 and 14 weeks are an effective treatment for those with mild to moderate levels of depression (National Institute for Clinical Excellence; NICE, 2009). In view of this, the Mental Health Foundation (2005) strongly promotes the prescription of exercise therapy as a first-line treatment option for those reporting symptoms of depression including minor levels of distress. It has been suggested that, compared to established treatments, exercise has a number of advantages as an effective mental health promotion strategy. Exercise programmes are potentially cost-effective, readily available and associated with few adverse side-effects, and thus present an attractive alternative to those who prefer not to use medication or access psychological therapy (Fox et al., 2000).

Engaging with exercise therapy has been shown to provide individuals with a sense of

autonomy (Crone, 2007). Additionally, exercise is not associated with the stigma that surrounds help-seeking for mental health problems and, as such, is viewed as a ‘normalising’ experience by many (Mental Health Foundation, 2005).

### *Exercise and Depression: Mechanisms of Change*

Decades of research has established a positive effect of exercise on symptoms of depression, however, the primary mechanisms which underlie this relationship remain poorly understood (Crone, Smith & Gough, 2005; Fox, 1999; Martinsen, 1994; Mead et al., 2009; Scully et al., 1998; Stathopoulou, Powers, Berry, Smiths & Otto, 2006).

Identifying processes that mediate the relationship between exercise and depression is vital as it advances our theoretical understanding of this relationship and provides guidance for designing optimal exercise programmes for mental health benefits (Taylor & Faulkner, 2008). It is likely that exercise acts on multiple synergistically interacting processes to reduce symptoms of depression (Biddle & Mutrie, 2001; Dunn et al, 2001; Hansen et al., 2001). In line with this contention, several biophysical and psychosocial mechanisms have been postulated to explain the complex relationship between exercise and depression (Crone et al., 2006; North et al., 1990; Taylor & Faulkner, 2008).

Mechanisms that have been proposed to mediate the antidepressant effect of exercise will be discussed in turn.

*Biophysical Mechanisms.* The endorphin hypothesis proffers a popular biochemical explanation for the exercise-depression relationship. According to the endorphin hypothesis, exercise induced increases in endogenous opioids such as endorphins directly affects mood (Ransford, 1982). By tradition the endorphin hypothesis has been embraced as a biological explanation for positive mood following exercise; however researchers have identified several limitations of this approach (Carr

et al., 1982; Dishman, 1985). Most notably researchers argue that no single biochemical system will solely explain the effect of exercise on dimensions of mood (Dishman & O'Connor, 2009). Exercise has also been shown to physiologically increase monoamine (i.e., serotonin, dopamine and norepinephrine) concentrations that operate to have an antidepressant effect (Barchas & Freedman, 1963; Bunney & Davis, 1965; Schildkrautt, 1965). Improvement in cardiovascular fitness as a result of exercise has additionally been suggested as a mechanism of change (Galper, Trivedi, Barlow, Dunn & Kampert, 2006; DiLorenzo et al., 1999; Morgan, 1969). However, others have challenged this contention demonstrating that improvements in depression occur prior to positive changes in fitness levels within an exercise programme (Veale et al., 1992). Other suggested mechanisms that have received some support as potential mediators of the relationship between exercise and depression include changes in core body temperature and increased muscle relaxation (Koltyn, 1997). More recently, Remington (2009) has suggested that prospective animal studies will help elucidate the bio-physical mechanisms underpinning the therapeutic effects of exercise by offering opportunities to better understand the biochemical changes associated with exercise.

*Psychosocial Mechanisms.* To date, the literature has more strongly implicated psychosocial mechanisms as explanations for exercise induced improvements in depression, although empirical research in this area is limited (Ryan, 2010). Based on psychological theory, suggested mechanisms have included increased social support, changes in cognitive processes such as distraction from depressive thoughts, improvements in perceived competence and improvements in self-esteem and physical self-perceptions (Bodin & Martinsen, 2004; Craft, 2005; Crone, 2007; Crone, Smith & Gough, 2005; DiLorenzo et al., 1999; Fox, 1999; McNeil, LeBlanc & Joyner, 1991; North et al., 1990; White, Kendrick & Yardley, 2009).

The idea that feeling socially connected to and supported by other people positively impacts on depression and mental distress is widely accepted (Repper & Perkins, 2003). It has been suggested that exercise provides an opportunity for people to build new social networks and relationships, most typically through group interaction, and that this increased social contact reduces feelings of depression (McNeil et al., 1991). Qualitative research conducted with both community samples and mental health service users engaged with exercise programmes demonstrates that positive social interaction with others is important in promoting mental health benefits from exercise and encouraging exercise enjoyment, motivation and adherence (Crone, 2007; Crone et al., 2005; Hardcastle & Taylor, 2001; Owens, Crone, Kilgour & Elansari, 2010). Cross-sectional research investigating the relationship between sports participation and life satisfaction further supports the role of social support as a partial mediator of the relationship between exercise and depression. Boone and Leadbeater (2006) reported that positive involvement in team sports promotes perceptions of social inclusion which, in turn, partially mediates depressive symptoms among adolescents.

The response styles theory of depression (Nolen-Hoeksema, 1991) proposes that individuals typically respond to feelings of depression using either rumination or distraction techniques. According to this theory, rumination is thought to have a negative influence on the course of depression and a distraction response style is associated with more positive outcomes (Nolen-Hoeksema, Marrow & Fredrickson, 1993). It has been proposed that exercise provides a distraction from worrisome thoughts and feelings given that people are often focused on somatic changes such as their breathing or on reaching training goals when working out (Craft, 2005; Chioqueta & Stiles, 2007; Lepore, 1997; North et al., 1990). Reports on the subjective experiences of mental health users engaged with physical activity programmes supports the

contention that exercise provides a distraction from negative affect (Crone & Guy, 2008; Owens et al., 2010). To empirically test the concept of distraction as an explanation for the anti-depressant effects of exercise, Craft (2005) compared the use of ruminative and distractive techniques among moderately depressed females participating in a nine week exercise programme to a control group. Findings provided some support for the theory of distraction. Compared to the control group, exercise was associated with a significant decrease in depression scores along with a reduction in the use of rumination and increased use of distraction techniques.

At present there is also support for change in self-efficacy as a mechanism by which exercise exerts a positive effect on symptoms of depression (Bodin & Martinsen, 2004; Chu, Buckworth, Kirby & Emery, 2009; Craft, 2005; Foley et al., 2008; Ryan, 2010; White et al., 2009). According to Bandura's (1977) Social Cognition Theory, behaviour is largely influenced by the key constructs of outcome expectancies (i.e., people's beliefs about the possible consequences of their actions) and perceived self-efficacy. Perceived self-efficacy refers to a person's level of confidence in their ability to perform particular behaviours to produce desired outcomes (Bandura, 1977). Bandura (1997) contends that a strong sense of self-efficacy enhances well-being and low self-efficacy contributes to anxiety and depression because of a lack of confidence in ability to manage stressors. Self-efficacy beliefs are influenced by different sources and can be enhanced through mastery or personal accomplishment; mastery experiences build coping skills and the belief that you can exert control over stressors (Bandura, 1997). According to Craft (2005), exercise may present an effective opportunity to enhance efficacy beliefs based on its ability to provide meaningful mastery experiences, such as learning new skills, successfully self-monitoring exercise behaviours, and setting and achieving training goals. Within the physical activity literature, research has

shown that exercise self-efficacy, operationalised as confidence in perceived physical abilities to perform exercise activities potentially mediates the exercise-depression relationship. White, Kendrick & Yardley (2009) found that within a sample of moderately depressed adults participation in exercise was related to increased self-efficacy beliefs and reduced levels of depression. Based on time-related changes in self-efficacy and depression in this study, the authors concluded that an increase in self-efficacy may be associated with depression response in the initial stages of engaging with an exercise programme.

The final psychosocial mechanism that has received some attention within the literature is self-esteem (Dishman et al., 2006; Van de Vliet et al., 2002). It is widely accepted that depressed individuals tend to report poor self-concept and low levels of self-esteem (Fox, 2000). Contemporary theory conceptualises self-esteem as a multifaceted and hierarchically organised construct (Marsh & Shavelson, 1985; Shavelson, Hubner & Stanton, 1976). According to this model, general self-esteem is positioned at the apex of a hierarchy of self-concepts including academic, social, emotional and physical domains which, in turn, are each related to more specific sub-domains. Expanding on Shavelson, Hubner and Stanton's (1976) theory of self-concept, the exercise and self-esteem model (EXSEM: Sonstroem, Harlow & Josephs, 1994) provides a framework for furthering our understanding of the positive relationship observed between exercise and depression. Specifically this model suggests that exercise influences perceived self-efficacy, which can lead to higher-level change in physical self-perceptions (such as competence and bodily acceptance) which can then generalise to change in overall physical self-concept. In turn, change in overall physical self-concept leads to higher-order changes in global self-esteem and consequently reduces feelings of depression (Van de Vleit et al., 2002). Research

employing the EXSEM has provided some support for the suggestion that changes in physical self-perceptions and self-esteem mediate the relationship between exercise and depression (Knapen et al., 2003; Van de Vleit et al., 2002; Van de Vleit et al., 2003; White et al., 2009). In a large sample of female adolescents, Dishman and colleagues (2006) found cross-sectional evidence suggesting that physical self-concept mediates the relationship between physical activity and self-esteem and, in turn, self-esteem is inversely related to self-reported symptoms of depression. White, Kendrick and Yardley (2009) found that, over time, all of the factors in the model (i.e., perceived self-efficacy, physical self-perception and self-esteem) showed improvements in a sample of depressed adults who engaged in physical activity. However, the authors were unable to fully determine a causal role among change in variables within the EXSEM and therefore longitudinal evidence for this model is limited. Consistent with this, Ryan (2008, 2010) proposes that exercise induced changes in self-efficacy beliefs, physical self-perception and self-esteem each exert direct independent effects on depressive symptoms. However, research in support of Ryan's (2008, 2010) contention is limited to cross-sectional studies conducted with university student samples.

The examination of putative mechanisms of change underlying the antidepressant effects of exercise is limited (Crone et al., 2005; Stathopoulou et al., 2006). In light of this, a main objective of this thesis was to investigate the mediating processes responsible for the therapeutic effect of exercise on depression. Specifically, study four (*chapter 5*) examined whether change in self-efficacy, physical self-concept and global self-esteem would mediate change in depression within an exercise intervention.

### *Psychotherapeutic Interventions and Mental Health Promotion*

In addition to sport and exercise, psychotherapeutic interventions such as Cognitive Behavioural Therapy (CBT) may be particularly suitable for addressing barriers to help-seeking specific to young adult males. In line with Addis and Mahalik's (2003) recommendations for the therapeutic process, CBT offers a strengths-based self-help approach aimed at promoting problem-solving skills. This type of psychotherapeutic intervention is expected to be congruent with masculine ideologies by addressing men's need for self-reliance and control (Mahalik, Good & Englar-Carlson, 2003). CBT is one of the most widely researched and practiced forms of psychotherapy for mental health difficulties (Wright, Basco & Thase, 2006). The CBT model for depression is based on the principles of both behavioural therapy (Eysenck, 1952) and cognitive therapy (Beck, Rush, Shaw & Emery, 1979). Therefore, cognitive behavioural interventions are based on two central tenets: that cognition plays a central role in the etiology and maintenance of psychological distress, and, how we act or behave influences our thought patterns (Beck et al., 1979). According to Beck's cognitive theory (Beck, 1964; Beck et al., 1979) depressed people hold negative beliefs and cognitions about themselves, their experiences in the world, and their future. Therefore, cognitive theory predicts that change in depression-related cognitions (i.e., cognitive restructuring) mediate psychotherapeutic treatment changes in depression (Beck et al., 1979). The contention that CBT benefits symptoms of depression by changing negative cognitive processes is widely supported (Garrett & Ingram, 2007). For example, in their sample of depressed adults, DeRubeis and colleagues (1990) found that change in cognitions predicted change in depressive symptoms for those treated with cognitive therapy but not for those who received pharmacotherapy. Similarly, Allart-van Dam and associates (2003) report that for adults with sub-clinical



depression changes in cognition appear to mediate change in symptom severity. Stemming from traditional behavioural therapy, one of the core CBT therapeutic techniques for treating depression is behavioural activation, which helps depressed individuals re-engage with their lives through focused activation strategies (Westbrook, Kennerley & Kirk, 2007). For example, the therapist encourages the client to increasingly engage in activities which provide pleasure or a sense of achievement. Westbrook and colleagues (2007) recommend that one such example of behavioural activation strategy is to encourage the client to engage in exercise.

In sum, CBT is an active, problem-orientated, educative therapy that seeks to identify and change maladaptive beliefs, attitudes, and behaviours that contribute to mental distress (Beck, 1995). To modify cognitive processes and teach individuals the self-help skills to manage current distress and to prevent future experiences of mental distress CBT employs a number of core strategies (Westbrook et al., 2007; White et al., 2006; Wills, 2009). It is argued that a psychoeducational approach is central to the core strategies employed within CBT, whereby, the therapist offers information from a psychologically informed point of view to help individuals to learn to change their thinking and behaviours (Wills, 2009). For example, the therapist can set ‘homework’, providing the opportunity for the client to apply the information and skills they learn in therapy to everyday life. Other such central features of CBT include Socratic questioning methods, the use of metaphors and the process of guided discovery which encourage individuals to acknowledge and evaluate dysfunctional thought patterns and behaviours (Scott, 2009; Westbrook, Kennerley & Kirk, 2007; White et al., 2006). CBT also emphasises the importance of a good therapeutic relationship whereby the therapist collaboratively works with clients to develop positive thinking styles and to build coping skills (McLeod, 2009).

The efficacy of CBT-based interventions for treating symptoms of depression of varying severity and in improving the mental health of wide-ranging populations is supported by significant empirical research (DeRubeis et al., 1990; DeRubeis, Gelfand, Tang & Simons, 1999; Laidlaw et al., 2008; Reinecke, Ryan & DeBois, 1998). Both individual and group CBT has proven to be beneficial for mental health most notable by improving symptoms of depression, and increasing perceived social support (Brown et al., 2005; Gaffney, Cosgrove & Collins, 2007; Kellett, Clarke & Matthews, 2007; Reinecke et al., 1998). UK government guidelines heavily endorse CBT interventions that include problem-solving skills for treating mild-to-moderate and severe depression. The National Institute for Clinical Excellence (NICE, 2009) recommend individual, group-based, or computerised CBT consisting of six to eight sessions over a period of approximately eight weeks for those with mild to moderate levels of depression.

In the Irish context, a large mental health promotion initiative, the 'Mind Yourself' programme (Gaffney, Cosgrove & Collins, 2007) has demonstrated the effectiveness of a brief group CBT intervention for improving coping strategies to better manage mental distress. The Mind Yourself project employed a strengths-based holistic life-skills approach to deliver two CBT sessions to young people aged 15-17 years. Evaluation of the Mind Yourself programme found that it was beneficial for reducing symptoms of depression and increasing perceived ability to cope with stress; the vast majority of participants who completed the intervention felt they were better equipped with coping strategies to manage threats to positive mental health (Gaffney et al., 2007). Employing a strengths-based holistic life-skills approach, a main aim of this thesis was to utilise psychotherapeutic interventions based on the principles of CBT to address men's need for self-reliance and control and to improve the mental health of young adult men. The delivery of CBT strategies specifically targeted at engaging young

males was facilitated by a group-based condition in study one and study three utilised the internet to deliver a CBT-based intervention specific to men.

### *Internet delivered CBT and Mental Health Promotion*

In recent years there has been a significant increase in research investigating the role of the *internet* in facilitating the delivery of CBT. Internet delivered CBT interventions have been shown to be effective in the prevention and treatment of depression and anxiety at the community level (Calear & Christensen, 2010; Griffiths & Christensen, 2006; Griffiths, Farrer & Christensen, 2010). For example, Christensen, Griffiths & Jorm (2004) found that a five-week internet delivered CBT programme was significantly more effective than a control condition in reducing symptoms of depression among an adult community sample. Systematic review studies reveal that compared to no treatment, CBT interventions delivered via the internet exert a moderate-to-strong effect on depressive symptoms (Griffiths et al., 2010; Spek et al., 2007). The effect sizes observed in trials examining the efficacy of internet-delivered CBT for depressive symptoms are comparable to those found in recent meta-analyses of traditional face-to-face psychotherapy (Cuijpers, vanStraten, Warmerdam & Andersson, 2008) and antidepressant treatment of depression (Turner, Matthews, Linardatoes, Tell & Rosenthal, 2008). However, few studies have investigated the effectiveness of internet mental health interventions for *specific* demographic groups, including young adult men (Griffiths & Christensen, 2006).

Population surveys report that young adult men have the highest level of internet use and that the internet plays a significant role in mental health information-seeking (Gallagher, Tedstone Doherty, Moran & Kartalova-O'Doherty, 2008; Powell & Clarke, 2006). The internet has utility in addressing many of the barriers to help-seeking

experienced by men and is therefore viewed by many as a valuable context for early intervention strategies aimed at promoting positive mental health and help-seeking behaviour (Burns, Durkin & Nicholas, 2009; Gallagher et al., 2008). Importantly, the internet has shown to be a valuable resource for those who experience stigma associated with help-seeking for mental health concerns through more traditional routes (Berger, Wagner & Baker, 2005; O’Kearney, Gibson, Christensen & Griffiths, 2006). This is supported by qualitative research where men report positive attitudes towards the internet as a potential resource for positive mental health promotion (Begeley et al., 2003; Russell et al., 2004). The internet is also widely accessible, it does not have geographical constraints and can be accessed at any time (Burns, Morey, Lagelee, Mackenzie & Nicholas, 2007), and thus presents an attractive alternative for those who do not want to access traditional psychotherapy. The anonymity and confidentiality afforded by the internet addresses men’s need for autonomy and control when help-seeking for mental health concerns (Burns et al., 2007). Internet based CBT interventions are also considered to be a potentially cost-effective mental health promotion strategy (Calear & Christensen, 2010). Given the effectiveness of online interventions and their utility in addressing barriers to help-seeking it has been recommended that internet delivered CBT should be pursued further as an alternative community-based treatment option for men experiencing minor mental distress (Andersson et al., 2005; Bennett, Reynolds, Christensen & Griffiths, 2010; Griffiths et al., 2010). Following from these recommendations, study three of this thesis aimed to deliver a CBT based intervention via the internet with the objective of engaging young adult men with mental health promotion and improving their mental health.

## *Summary*

There is a clear need for alternative mental health promotion specific to young men; aimed at encouraging help-seeking and providing men with effective coping strategies to deal with distress in their everyday lives so that minor difficulties do not escalate unnecessarily. We know that changes to mental health support services will not make an impact unless young people are willing to engage and use them; therefore, mental health promotion strategies need to be attractive to young men (Burke & McKeon, 2007; Pringle & Sayers, 2004). Recommendations for engaging young men in mental health promotion emphasize that men would benefit from gender-specific psychotherapeutic intervention strategies and that support services need to be made easily accessible within the community (Addis & Mahalik, 2003; Begley et al., 2003; Cochran & Rabinowitz, 2003; Richardson & Carroll, 2009; Rickwood et al., 2005; Russell et al., 2004; Tedstone Doherty et al., 2008). Suggestions for viable methods of providing support and promoting positive mental health among young men have included utilising sport programmes and the internet (Addis & Mahalik, 2003; Begley et al., 2003; Burke & McKeon, 2007; Pringle & Sayers, 2004; Russell et al., 2004). Consistent with current recommendations, and in line with low intensity stepped care interventions, the central aim of this thesis was to explore the effectiveness of alternative exercise and sports-based psychotherapeutic strategies for facilitating help-seeking and improving the mental health of young men.

## *Objectives*

*Study 1 (Chapter 2).* Existing research supports the efficacy of both exercise and psychotherapy for improving mental health (Mead et al., 2009). To date, however, no investigation has examined the integration of exercise and psychotherapeutic strategies for improving mental health among men. Further, very few studies have employed the context of sport as a means to deliver a targeted alternative mental health intervention. As such, the objective of this study was to investigate the effectiveness of a team-based sport/psychosocial intervention for young men's mental health. Specifically, we employed a randomised controlled trial to examine the effectiveness of an integrated team sport/psychosocial intervention (Back of the Net; BTN programme) with an individual exercise programme and a control condition for symptoms of depression and perceived social support in young men.

*Study 2 (Chapter 3).* This study builds upon study one to qualitatively explore young men's experiences of the integrated team sport/psychosocial intervention. The general aim of study 2 was to explore the way in which the participants perceived, understood and experienced the BTN programme. Specifically, focus group and interview methodology was employed to uncover the perceived acceptability and effectiveness of an integrated sports-based exercise and psychotherapeutic intervention from the male point of view.

*Study 3 (Chapter 4).* In building on existing literature and recommendations, the main objective of this study was to investigate the effectiveness of a combined exercise and internet delivered psychotherapeutic intervention for young men's mental health. In building on the findings of studies 1 and 2, this study explores the value of sports-based psychotherapeutic strategies targeted at men via the internet. Literature on the utility of online cognitive-behavioural interventions specifically targeted at engaging young men

and improving their mental health is lacking. To date, no study has explored the effectiveness of a combined programme of structured exercise and internet delivered cognitive behavioural therapy (CBT) for young men's mental health. Specifically, we employed a randomised controlled trial to examine the effectiveness of these combined strategies compared with an individual exercise programme, an internet delivered CBT intervention ('LifeFit') and a control condition for symptoms of depression and perceived social support among men.

*Study 4 (Chapter 5).* The objective of study 4 was to understand the psychosocial mechanisms of change underpinning the significant effects of exercise for symptoms of depression observed in studies 1 and 3. Existing literature suggests several psychosocial theories to account for the positive relationship between exercise and depression. However, the processes responsible for the psychotherapeutic effect of exercise remain poorly understood (Stathopoulou et al., 2006). To date, no research has longitudinally examined concurrent change in several psychosocial mediators in an exercise condition relative to a control group. Specifically, this study sought to investigate whether change in self-efficacy, physical self-concept and global self-esteem would mediate change in depression within an exercise intervention. A second aim of this study was to explore the temporal pattern of change among potential mediators and depression.

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## **CHAPTER 2**

# **EXPLORING THE EFFECTIVENESS OF AN INTEGRATED EXERCISE/CBT INTERVENTION FOR YOUNG MEN'S MENTAL HEALTH**

## Abstract

**Objective:** This pilot study investigated the effectiveness of a team based sport/psychosocial intervention (Back of the Net, BTN) with an individual exercise (IE) and a control condition for the mental health of young men.

**Design:** 10 week randomized control trial and 8 week post-intervention follow-up.

**Methods:** 104 sedentary males aged between 18 and 40 years were recruited and randomly assigned to the BTN, IE or a control condition. The BTN programme integrated team-sport (i.e., football) and cognitive-behavioral techniques. IE sessions included aerobic and resistance training. The control group refrained from exercise. Participants completed the Beck Depression Inventory-2<sup>nd</sup> Edition (BDI-II), the Social Provisions Scale (SPS) and a short qualitative questionnaire at pre-intervention, week 5, post-intervention and at 8 week follow up.

**Results:** Participants in both the BTN and the IE condition demonstrated a significant decrease in BDI-II scores compared to the control condition at post-intervention and at 8 week follow-up. The IE condition demonstrated significantly greater perceived social support than the BTN condition at week 5 and the control group at 8 week follow-up. Qualitative data supports the main empirical findings.

**Conclusion:** Exercise based interventions were effective in reducing symptoms of depression in a non-clinical community sample of young men. The BTN programme demonstrated potential for improving the mental health of young men however larger scale community based research is warranted to further examine the effectiveness of this type of intervention.

Early experiences of subdiagnostic and diagnostic levels of depression increase the risk of mood disorders over the long-term (Smith & Blackwood, 2004). Yet, research indicates that young men are among those least likely to access professional help for mental health difficulties (Biddle, Gunnell, Sharp & Donovan, 2004; Russell, Gaffney, Collins, Bergin & Bedford, 2004). Some of the main reasons cited for men's reluctance to seek help include a need for self-reliance and a dislike of talking to strangers about emotional problems (Begley, Chambers, Corcoran & Gallagher, 2003; Burke & McKeon, 2007). Other barriers to help-seeking include anticipated embarrassment and the stigma associated with mental health difficulties. Ironically the stigma associated with help-seeking is thought to be more pronounced for less severe psychological problems. Voluntarily seeking professional help for psychological distress is viewed by males as a sign of weakness (Tedstone Doherty & Kartalova-O'Doherty, 2010; Vogel, Wade, & Haake, 2006). Unfortunately the reluctance of males to avail of formal channels of support when experiencing psychological problems can lead to an escalation in distress levels and a need for more intensive treatment (Tedstone-Doherty & Kartalova-O'Doherty, 2010). It is clear that there is a need for mental health promotion and prevention strategies that are 'attractive and accessible' to young men in an effort to increase the uptake of support in this difficult to reach target group (Tedstone-Doherty & Kartalova-O'Doherty, 2010; Pringle & Sayers, 2004). In line with this recommendation, the present pilot study explored the effectiveness of a 10 week team based sport/psychosocial intervention, BACK OF THE NET (BTN), for men's mental health.

To address men's need for self-reliance and control, psychotherapeutic interventions such as Cognitive Behavioural Therapy (CBT) may be particularly suitable for this population group. CBT places emphasis on identifying and changing

maladaptive cognitions and behaviours that contribute to emotional distress (Reinecke & Didie, 2005). CBT techniques aim to enhance self-control, rational problem-solving abilities and social skills with a view to fostering long-term coping capability (Reinecke, Ryan & DuBois, 1998). Both individual and group CBT has proven to be beneficial in addressing indices of mental health such as depression and perceived social isolation (Brown at al., 2005; Gaffney, Cosgrove & Collins, 2007). Research has also shown that compared to treatment as usual, CBT based interventions comprised of communication and social-skills building significantly improve participants' perceptions of social support (Reinecke & Didie, 2005).

It has been suggested that approaching young men about mental health issues in contexts which are viewed by males as 'acceptable' is critical to their engagement (Pringle & Sayers, 2004). Using a group psychoeducational approach and football as a metaphor, the 'It's a Goal' community project in the Northeast of England successfully engaged young men in a six week mental health promotion programme in a community football club. Post programme evaluation demonstrated the effectiveness of sport as 'both motive and method' for engaging young men (Pringle & Sayers, 2004).

Similar to Pringle and Sayers' (2004) 'It's a Goal' project, the current study used the context of sport (i.e., football) to deliver a mental health intervention targeted at men. However, in this instance, unlike the 'It's a Goal' project, participants were required to physically participate in playing football. Studies have shown that physical activity is as effective as CBT for symptoms of depression (Mead et al., 2008). Systematic reviews of the effectiveness of exercise interventions for symptoms of depression have indicated significant positive findings for various types of exercise (i.e., aerobic, mixed and resistance) and for exercise conducted at different intensities (Mead et al., 2008). A number of mechanisms by which exercise benefits symptoms of



depression have been proposed. For example, in terms of psychological mechanisms, it is suggested that exercise can positively influence perceived self-worth and mood via increased skill mastery and physical fitness (McNeil, LeBlanc & Joyner, 1991). Research also demonstrates that social support and other aspects of team sport involvement enhance perceived social inclusion and partially mediate risk for depressive symptoms (Boone & Leadbeater, 2006). With respect to physiological mechanisms, changes in endorphin and monoamine levels induced through exercise may also play a role in the regulation of mood (Duclos, Gouarne & Bonnemaïson, 2003).

To date, the value of integrated exercise/CBT interventions for mental health has been largely unexplored (Mead et al., 2008). Further, we are unaware of any intervention research that has specifically focused on the mental health of young men. As such, this pilot randomized controlled trial compared the effectiveness of an integrated team sport/psychosocial intervention BACK OF THE NET (BTN) with an individual exercise (IE) condition and control condition for symptoms of depression and perceived social support in young men. A team based exercise condition facilitated the delivery of CBT strategies through group discussion and various other group activities. The group context also allowed for the purposeful facilitation of social support. In contrast, an individual exercise condition was chosen as a comparison group because it afforded relatively fewer opportunities for social interaction. It was hypothesised that participants in the team sport/psychosocial intervention would have significantly lower scores on a self report measure of depression and significantly higher scores on measures of perceived social support compared to the individual exercise condition and controls at the end of the ten week intervention and at two month follow-up. A further

aim of this study was to examine the feasibility and acceptability of the BTN intervention and to test recruitment procedures prior to conducting a main trial.

## Method

### *Participants*

With institutional ethical approval 104 men aged 18-40 years were recruited for this study via advertisements placed locally in newspapers, health centres, pubs, restaurants and local businesses. Participants were recruited over a 3 week period in late spring 2008; two local newspapers ran one advert each and a team of two researchers placed advertisement posters and leaflets in community centres, social welfare offices and businesses. Since unemployment has been shown to be a risk factor for depression in young males we also attempted to recruit men from local employment agencies and local branches of FAS, Ireland's National Training and Employment Authority. Advertisements stated that we were looking for young adult men interested in getting fit to take part in a study investigating the benefits of exercise on well-being. Eligibility criteria included being aged between 18 and 40 years, sedentary (i.e., currently exercising once per week or less) and not currently receiving any psychiatric treatment. Exclusion criteria included major physical health problems that would prevent participation in exercise for the duration of the study; current drug or alcohol abuse problems and current use of antidepressants. Overall, there was an acceptable level of interest in this study. Response rates indicated that the majority of enquires stemmed from the local newspaper adverts, while uptake via the local employment agencies was very poor. Study eligibility was assessed via initial telephone screening, self-report measures and physician assessment.

### *Design & Protocol*

This study was a 10 week randomised control trial of differential exercise-based interventions for mental health. The main investigator allocated participants to either an individual exercise condition (IE,  $n = 36$ ), a team sport/CBT- guided intervention (BTN,  $n = 38$ ) or a control group (C,  $n = 30$ ) using a random number table.

Given that no research has exclusively examined an all male population or employed a similar type of integrated sport/CBT guided intervention, sample size calculations were based on related review studies of exercise for symptoms of depression (Mead et al., 2008). Specifically, the size required was calculated by using depression as the primary outcome (predicted effect size of 0.6, providing 80% power,  $p < .05$ ). It was estimated that a minimum of 30 participants per condition were required to detect a difference between the intervention groups and control.

For exercise studies blinding participants to condition allocation is not possible. Immediately prior to commencement of the intervention the main investigator randomised participants to study condition and informed participants of condition allocation. At this time, with written informed consent, all participants were asked to provide demographic details and to complete a baseline questionnaire which included quantitative measures and qualitative questions. Participants also completed a medical screening form which assessed current engagement in exercise and included a number of commonly used pre-exercise screening questions from the Physical Activity Readiness Questionnaire (PAR-Q; Thomas, Reading & Shephard, 1992). Individuals in the IE and BTN condition underwent a physical examination by the study physician. If any participant was found to have a medical condition that would put him at risk during exercise he was excluded from participation in the study. In addition, if any participant

was found to be experiencing clinical levels of depression, he was evaluated by the physician and offered the opportunity to meet with a qualified clinical psychologist.

### *Intervention*

Participants in the IE and BTN conditions were invited to an initial familiarisation session during which a researcher explained the differences between different heart rate intensities and demonstrated how to wear a heart rate monitor. In accordance with recommendations made by Dunn, Trivedi, Kampert, Clark and Chambliss (2005), participants were asked to exercise to moderate exercise intensity which was calculated based on 70 to 80% of age predicted heart rate. Individuals in the IE condition were shown how to use the gym equipment and were given the opportunity to familiarise themselves with the equipment and exercising to moderate intensity. Individuals in the BTN condition were shown the artificial football pitch and were given the opportunity to participate in a few drills to familiarise themselves with exercising to moderate intensity.

Participants in the IE and BTN conditions were asked to attend a maximum of 20 exercise sessions over the 10 week intervention period; no instruction was given as to whether individuals should increase their level of physical activity outside of the assigned study sessions. Each session lasted 55 minutes and was supervised by one of the researchers. Participants in the IE condition engaged in independent aerobic and resistance training in the university gym. Each session consisted of a 10 minute warm-up, 40 minutes of intermittent exercise and a 5 minute warm-down. With the aid of the Polar heart rate monitor watch, participants were asked to maintain their heart rate within the assigned range for no less than 35 minutes. A researcher checked that participants were exercising to moderate intensity at 15 minute intervals.

Each BTN session consisted of 5 to 12 men and was facilitated by a football coach and one of the researchers. Participants began each session with a 10 minute warm-up, 5 minute drills, and a 10 minute conditioned game, followed by a 25 minute game and a 5 minute warm-down. The 25 minute game was divided into two 10 minute halves with approximately a 5 minute half time interval. In football, conditioned games are instances where the coach imposes a ‘condition’ on the game with the aim to encourage players to focus on one particular aspect of the game. For example, to encourage teamwork and communication, a condition can be set whereby every player on the team must touch the ball before a goal can be scored. This condition emphasises the importance of communication and working together as a coherent team in achieving goals.

The BTN intervention employed CBT techniques to address a weekly theme which was integrated throughout the entire training session. These themes were relaxation, teamwork, identifying personal positive strengths, goal-setting, problem solving, resilience, avoiding harmful situations, self-care behaviour and communication. Each theme influenced how sessions in that given week were structured. Drills and conditioned games were designed to reinforce the theme topic and key words (e.g., fun, teamwork, bounce back) were introduced to reiterate the central objective of each theme. Core features of CBT such as guided discovery, psychoeducation, skill building and homework were incorporated into each session. For example, a central feature of the BTN intervention was the use of football metaphors in the designated half-time team-talk to facilitate guided discovery and group discussion around the session theme. The use of football metaphors encouraged players to make links between sport and life and to discuss life issues in an acceptable context by sharing their experiences and opinions. Points made in the ‘team talk’ were reiterated by the coach and researcher

through the remainder of the session. In terms of homework, each week players were asked to either reflect on the weekly theme in some way or carry out a behavioural task. For example, for the theme of relaxation, players were asked to incorporate relaxation techniques (i.e., progressive muscular relaxation and diaphragmatic breathing) into their daily lives. Participants discussed whether or not they found the homework tasks beneficial at subsequent sessions, however adherence to homework tasks was not explicitly monitored. Social skill building was facilitated both during and after each session at which time a light snack was offered to players in an effort to encourage players to spend a few minutes socialising post session.

A team heart rate monitor system recorded the exercise intensity for each individual. Similar to the IE condition, the aim was to maintain targeted heart rate range for no less than 35 minutes. Weekly protocol for each theme was documented by the researcher and changes to the original session plans were noted. To confirm study integrity, a checklist completed by the researcher following each session assessed that each session objectives were met. The checklist was used to ensure that the warm-up, drills, conditioned games and five-a-side games including the team talk were designed to incorporate the CBT intervention and that these interventions were implemented as planned. The checklist was also used to verify that post-session socialisation had been encouraged. At various time-points an independent observer completed an integrity check.

Participants assigned to the control condition were advised that they could avail of the gym facilities after the 10 week study period. During the 10 week duration of the study participants in the control group were asked to refrain from exercise. All participants were asked to respond to the same quantitative measures and qualitative questions again at weeks 5 and 10 and once more at 8 weeks post-intervention as part of

follow-up data collection. Participants completed questionnaires at the university sports complex at the relevant time points.

### *Measures*

#### *Beck Depression Inventory-2<sup>nd</sup> Edition (BDI-II)*

The BDI-II (Beck, Steer & Brown, 1996) is a 21-item self-report instrument that measures the presence and severity of somatic and affective symptoms of depression. Responses to each item are rated on a 4-point scale ranging from 0 to 3 in terms of symptom severity. A total BDI-II score of 13 or less is within the minimal range of symptom severity, a total score ranging between 14 and 28 is considered mild/moderate and between 29 and 63 is considered indicative of severe depression. The BDI-II has been validated with both psychiatric and normative populations and has been shown to have good reliability (Beck, Epstein, Brown & Steer, 1988). In this study, the Cronbach alpha coefficient for the BDI-II was .85.

#### *Social Provisions Scale (SPS)*

The SPS (Cutrona & Russell, 1987) assesses the extent to which one perceives their social relationships to be supportive and nurturing. This 24-item scale assesses the presence and absence of social attachment, social integration, reassurance of worth, reliable alliance, guidance and opportunity for nurturance. Responses to each item are rated on a 4-point scale ranging from 1 to 4. Total SPS scores range from 24 to 96 with higher scores indicating a greater degree of perceived support. The SPS has demonstrated good reliability and validity with a number of populations including psychiatric, low income and all male samples. (Caron, Tempier, Mercier & Leouffre, 1998; Cutrona & Russell, 1987; Wester, Christianson, Vogel & Wei, 2007). In this study, the Cronbach alpha coefficient for the SPS was .91.

### *Short Qualitative Questionnaire*

The researchers devised a short qualitative questionnaire which included a number of open-ended questions related to psychological health and exercise. Participants were asked “How would you describe your life at the moment?”, “What do you think about sports and exercise?” and “Why do you think it is beneficial for people to exercise?”

### *Alcohol consumption*

A short questionnaire was devised to indicate the units of alcohol consumed by participants. Participants were asked to report the number of days in a week they typically consumed alcohol and the number of units they would typically consume on average in one day. As a guide, participants were told that 1 unit of alcohol is equivalent to half a pint of beer, a pub measure of fortified wine or a small glass of wine; 1½ units is equivalent to a pub measure of spirits and 2 units is equivalent to a pint of beer or a large glass of wine.

### *Heart Rate*

Two types of heart rate monitors were used in this study, the Polar Team System and the Polar RS400. The Polar Team System consists of 10 individual transmitter belts. Participants in the BTN condition each wore a transmitter belt throughout each football session. The Polar RS400 individual heart rate monitors consisted of a transmitter belt and a watch which allowed participants to monitor their own heart rate. Participants in the IE condition wore both the transmitter belt and the RS400 watch throughout each gym session. Heart rate data was analysed using the Polar ProTrainer 5 software.



## *Data Analysis*

Descriptive statistics, internal reliability and correlation analyses were initially run on all the variables of interest. One-way Analysis of Variance (ANOVA) and Fisher Exact Tests were employed to compare baseline measures across the three groups. To evaluate group differences across time on depression and social support, mixed effects regression analyses were used. This type of analysis is an extension of the general linear model in which the factors and any covariates are assumed to have a linear relationship to the dependent variable. Linear mixed model analyses is optimal for examining repeated measures in the absence of missing data ensuring an intent to treat analysis as randomised (Brown & Prescott, 1999; Gueorguieva & Krystal, 2004). Specifically, this analysis uses all available data on each subject and is unaffected by randomly missing values. In all models the participant was assumed to be random and the intervention condition, time and condition by time interaction were included as fixed effects. Linear mixed models assume a linear relationship between the independent variable and the outcome variable. In the event of significant main or interaction effects, post hoc planned comparisons were employed to test for a linear trend in outcome scores over time. Statistical output for this type of analysis presents the mean response for each factor which is *adjusted* for any other variables in the model. In this study, a complete model was fit to test for main and interaction effects and as such any adjusted means reported are identical to the observed means. SPSS version 17.0 was used for analyses; the primary analyses were explored using the '*Mixed Models*' option. An alpha level of .05 was used for all statistical tests. The effect size of the exercise based interventions on levels of depression and perceived social support was calculated employing Hedges' *g*.

Of the 104 men enrolled in the study, 18% did not begin the intervention and therefore were excluded from the final analysis. The remaining 85 participants did not deviate from random allocation and therefore were analysed in the conditions to which they were randomly assigned (see Figure 2.1). Preliminary diagnostic statistical analysis resulted in the elimination of one participant. The final sample size of 84 participants represented 81% of the original sample.

Individual responses to the short qualitative questionnaire were transcribed verbatim and analysed employing steps consistent with an inductive thematic analysis approach (Braun & Clarke, 2006). Analysis involved reading and re-reading transcripts to become familiar with the data and to look for patterns and emerging themes; data was systematically analysed until no new themes emerged (Strauss & Corbin, 1998).

## Results

### *Descriptive Statistics*

In terms of correlation, a small negative non significant association was observed between the two variables of interest at baseline ( $r = -.20, n = 73, p > .05$ ). The mean (*SD*) age of the sample was 27.99 (4.93) years; 93% were white, 4% were Asian; 1% were African and 2% described themselves as mixed ethnicity. 73% were not involved in any exercise at study entry. At pre-intervention 21% of the overall sample reported mild to severe depression as measured by the BDI-II. Mean baseline depression scores for the total sample recruited are consistent with mean BDI-II scores for normative community samples (Seggar, Lambert & Hansen, 2002), indicating that this sample were representative of the targeted population. No statistically significant differences between the three groups on any baseline characteristic were noted (see Table 2.1).

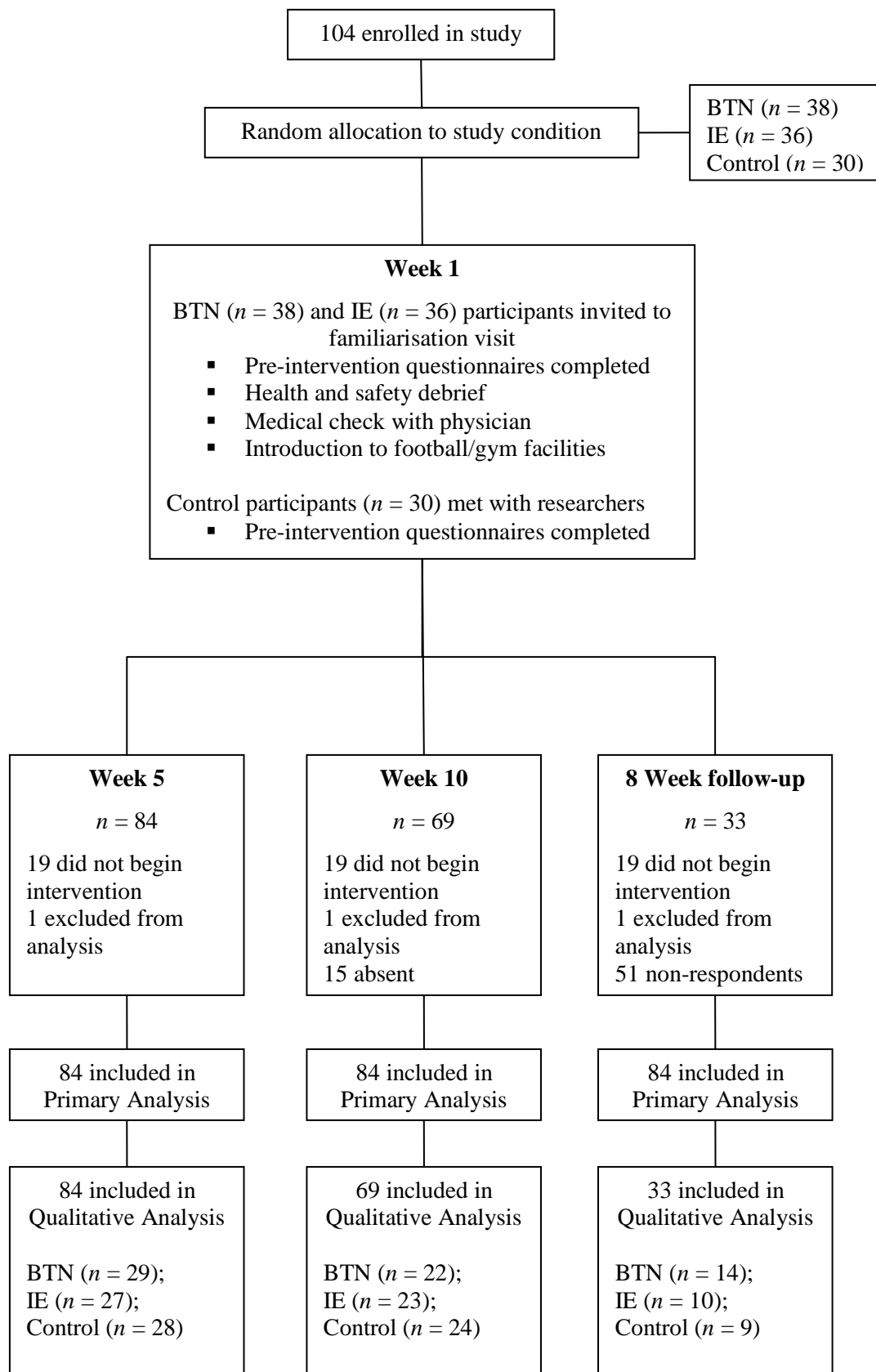


Figure 2.1. Flow of Participants through the study

Table 2.1.

## Baseline values by study condition

Variable	Control n = 28	IE n = 27	BTN n = 29	Total n = 84	P Value
Age, mean years (SD)	27.00 (4.40)	27.67 (5.47)	29.24 (4.80)	27.99 (4.93)	.21 <sub>a</sub>
Range, years	18 – 35	18 – 36	22 – 40	18 – 40	
Ethnicity					.15 <sub>b</sub>
White, n (%)	27 (96)	27 (100)	24 (83)	78 (93)	
Asian, n (%)	1 (4)	0 (0)	2 (7)	3 (4)	
African, n (%)	0 (0)	0 (0)	1 (3)	1 (1)	
Other ethnicity, n (%)	0 (0)	0 (0)	2 (7)	2 (2)	
Employed, n (%)	24 (86)	20 (74)	25 (86)	69 (82)	.46 <sub>b</sub>
Marital Status					.45 <sub>b</sub>
Single, n (%)	24 (86)	21 (78)	20 (69)	65 (77)	
Married, n (%)	4 (14)	6 (22)	8 (28)	18 (22)	
Divorced, n (%)	0 (0)	0 (0)	1 (3)	1 (1)	
Smoking, n (%)	11 (39)	5 (19)	8 (28)	24 (29)	.24 <sub>b</sub>
Consume Alcohol, n (%)	23 (82)	22 (81)	28 (97)	74 (88)	.14 <sub>b</sub>
Units Alcohol p/w, (SD)	17.50(9.01)	19.41(15.61)	19.34(15.48)	18.78(13.67)	.87 <sub>a</sub>
Exercising					.25 <sub>b</sub>
Not Exercising, n (%)	23 (82)	19 (70)	19 (66)	61 (73)	
Exercise once p/w, n (%)	5 (18)	8 (30)	10 (34)	23 (27)	
BDI-II, mean (SD) <sub>c</sub>	8.93 (6.97)	8.94 (6.98)	9.45 (7.00)	9.11 (6.98)	.95 <sub>a</sub>
SPS, mean (SD) <sub>c</sub>	82.49 (9.20)	81.61 (9.31)	77.31 (8.58)	80.47 (9.71)	.33 <sub>a</sub>

Abbreviations: p/w, per week; BDI-II, Beck Depression Inventory-2<sup>nd</sup> Edition; SPS, Social Provisions Scale.

<sub>a</sub> One-way ANOVA, <sub>b</sub> Fisher Exact Test, <sub>c</sub> Adjusted mean (SD) score

There was no significant difference in the number of sessions attended at week 5 between the IE ( $M = 7.11$ ,  $SD = 1.53$ ) and the BTN ( $M = 7.07$ ,  $SD = 2.52$ ) condition,  $t(47) = .08$ ,  $p > .05$ . Similarly, there was no significant difference for number of sessions attended at week 10 between the IE ( $M = 15.65$ ,  $SD = 3.89$ ) and the BTN ( $M = 14.82$ ,  $SD = 4.19$ ) condition,  $t(43) = .69$ ,  $p > .05$ . Analysis of HR intensities over the course of the 10 week intervention indicated that on average, participants in both exercise conditions maintained targeted heart rate range for no less than 35 minutes.

There was a 39% return rate for questionnaires administered at 8 weeks follow-up. An assessment of exercise behaviour at this time indicated that for those participants who completed the follow-up measures, 33% of participants (i.e. 3 out of 9) in the control condition were exercising compared to 90% of participants in the IE (i.e. 9 out of 10) and 86% of participants in the BTN condition (i.e. 12 out of 14). 96% of individuals (i.e. 23 out of 24) in the IE and BTN conditions indicated that participating in the study encouraged them to continue to exercise.

### *Intervention Outcomes*

#### *BDI-II*

With BDI-II as the dependent variable, results indicated a significant effect for time  $F(3, 53) = 7.07$ ,  $p < .01$ , and condition by time interaction  $F(6, 53) = 3.38$ ,  $p < .01$ . Planned comparisons were examined to test for a linear trend in BDI-II scores over time for each condition and to examine significant condition by time interactions. The results indicated a significant downward trend for the IE  $t(60) = -3.79$ ,  $p < .01$  and BTN  $t(60) = -4.95$ ,  $p < .01$  condition on depression scores over time. Time significant changes were observed for both the IE  $t(81) = 2.89$ ,  $p < .01$  and BTN  $t(81) = 2.36$ ,  $p < .05$  conditions between week 1 and week 5 and again for both the IE  $t(72) = 4.31$ ,  $p < .01$ , and BTN  $t(76) = 3.86$ ,  $p < .01$ , conditions between week 1 and week 10. Time

significant changes were again observed for both the IE  $t(61) = 3.32, p < .01$  and BTN  $t(60) = 4.37, p < .01$  conditions between week 1 and 8 week follow-up. Unlike the IE condition there was also a significant change in depression scores for the BTN condition between week 5 and 8 week follow-up  $t(29) = 2.90, p < .01$ . No other statistically significant changes across time points were observed.

With respect to significant interaction effects, post-hoc planned comparisons showed significant condition differences in BDI-II scores at week 10 between the control and the IE condition  $t(69) = 2.81, p < .01$ , and between the control and the BTN condition  $t(71) = 2.23, p < .05$ . Significant group differences in BDI-II scores were again observed at 8 week follow-up between the control condition and the IE condition  $t(34) = 3.25, p < .01$  and between the control condition and the BTN condition  $t(33) = 3.68, p < .01$ . No significant differences were found between the IE and BTN condition over the four time points. The magnitude of effect size on the BDI-II was -0.81 for the IE and -0.66 for the BTN condition at week 10. Effect size for IE was -1.58 and -1.42 for the BTN condition at 8 week follow-up. The adjusted mean total scores for condition over time on BDI-II scores are presented in Table 2.2 and Figure 2.2.

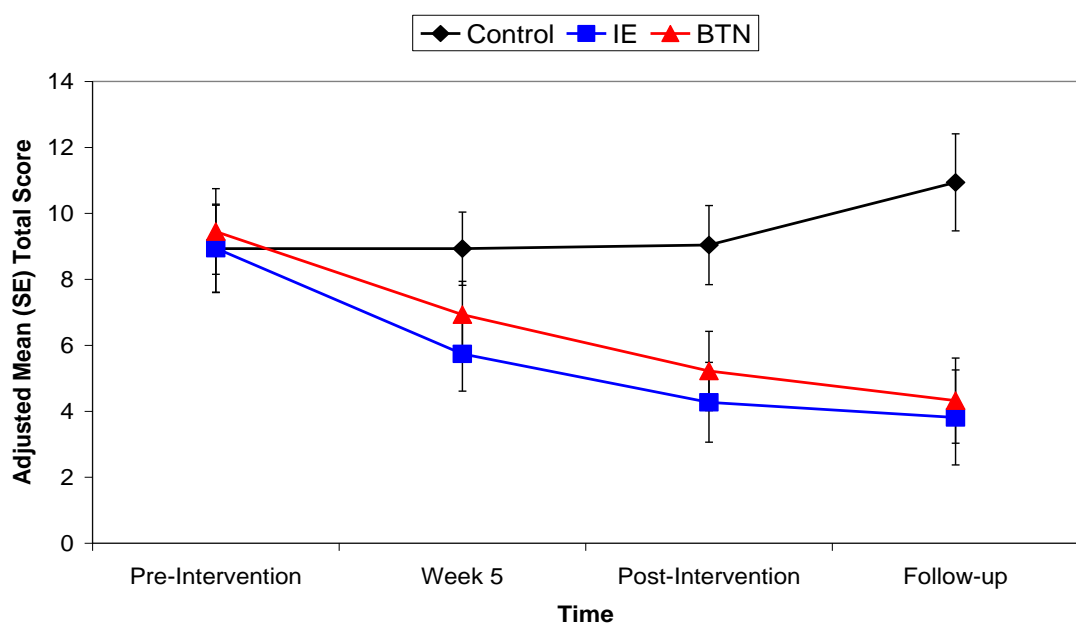


Figure 2.2. Adjusted mean scores for BDI-II across time

## SPS

With SPS as the dependent variable, results indicated a non-significant effect of time  $F(3, 54) = 1.38, p > .05$ , and a significant condition by time interaction effect  $F(6, 53) = 3.13, p \leq .01$ . Planned comparisons were examined to explore significant condition by time interaction effects. Post-hoc planned comparisons showed significant condition differences in SPS scores at week 5 between the IE and the BTN condition  $t(81) = 3.10, p < .01$  and between the control and the IE condition  $t(55) = -2.45, p < .05$  at 8 week follow-up. No significant differences were found between the control and BTN condition over the four time points. The magnitude of effect size on the SPS score at week 5 for the IE group was 0.80 and 1.11 at week 8 follow-up. The adjusted mean total scores for the three conditions on the SPS over time are presented in Table 2.2 and depicted graphically in Figure 2.3.

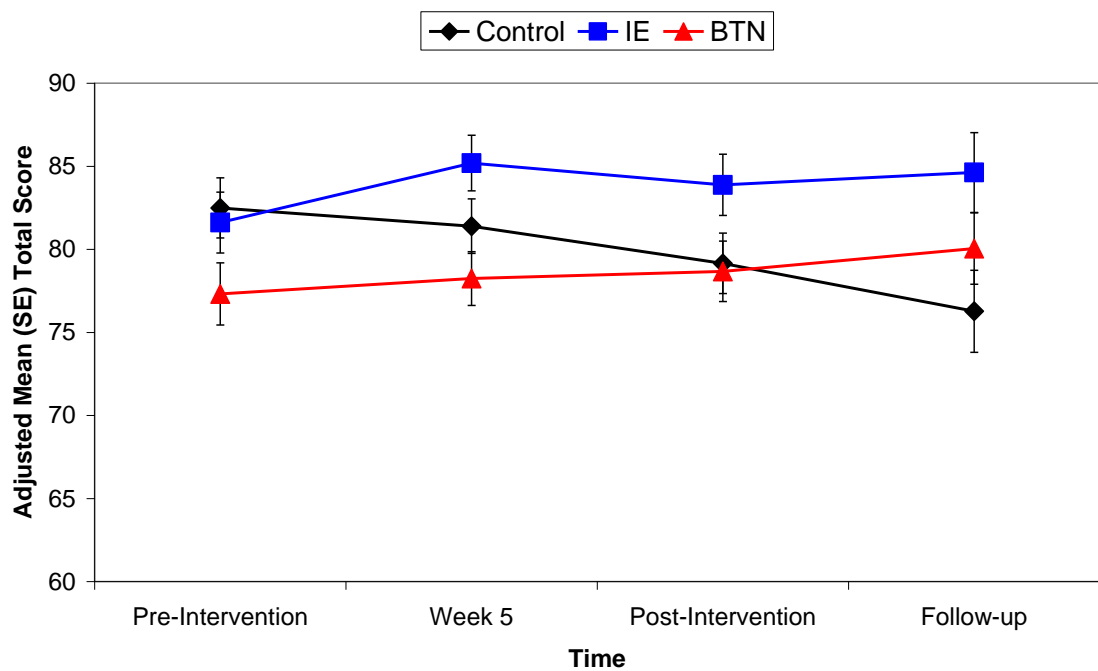


Figure 2.3. Adjusted mean scores for SPS across time

Table 2.2.

## Changes in Total Scores across Time

		Adjusted Mean (SD)			
		Range			
		Week 1	Week 5	Week 10	8 Week Follow-Up
Control	BDI-II	8.93 (6.97)	8.93 (5.86)	9.04 (5.85)	10.94 (4.42)
		0 – 24	1 – 20	0 - 25	1 - 15
	SPS	82.49 (9.20)	81.39 (8.54)	79.15 (8.92)	76.27 (7.41)
		70 – 96	66 - 96	62 - 93	62 - 94
IE	BDI-II	8.94 (6.98)	5.74 (5.86)	4.27 (5.91)	3.81 (4.54)
		0 – 30	0 – 17	0 - 14	0 – 10
	SPS	81.61 (9.31)	85.19 (8.70)	83.89 (9.01)	84.62 (7.59)
		52 – 96	61 - 95	58 - 96	56 – 93
BTN	BDI-II	9.45 (7.00)	6.93 (5.85)	5.22 (5.74)	4.32 (4.82)
		0 – 25	0 – 31	0 - 15	0 - 7
	SPS	77.31 (8.58)	78.24 (8.70)	78.67 (8.73)	80.04 (8.03)
		59 – 91	59 -96	57 - 96	67 - 96



### *Rates of Change*

The percentage change in BDI-II scores from pre- to post-intervention for the control condition was a 1% increase. The mean BDI-II score for the IE condition decreased by 52% from pre- to post-intervention. For the BTN condition mean BDI-II decreased by 45% over the 10 week intervention period. Higher scorers on the BDI-II were identified as those who reported total scores of 14 or more at baseline ( $n = 19$ ). Within the control condition the mean BDI-II score for these participants decreased by 9% from pre- to post-intervention. Mean BDI-II decreased by 46% for high scoring participants within the IE condition and by 60% for high scoring participants within the BTN condition from pre- to post-intervention.

The average SPS score for the control group decreased by 4% from pre- to post-intervention. The mean SPS score for the IE and BTN group increased by 3% and by 2% respectively.

### *Qualitative Data*

In analysing qualitative data, broad themes emerged from participant's responses which reflected their perceptions of their lives at that moment and their attitude towards sports and exercise. In subjectively describing their lives, the themes 'life is good or improving', 'room for improvement' and 'unhappy/stressed' emerged. At pre-intervention 44% of the control group described their lives as good or improving, this is comparable to 38% of those in the IE intervention group and 52% of those receiving the BTN intervention. At post-intervention 38% of the control group continued to view their lives in a positive manner compared to 82% and 80% of those in the IE and BTN conditions respectively. At follow-up 22% of the control group

continued to view their lives in a positive manner compared to 90% and 79% of those in the IE and BTN conditions respectively.

In analysing participant's attitudes towards sports and exercise the themes 'viewed positively', 'would like to do more' and 'boring/overrated' emerged. At pre-intervention 59% of the control group expressed positive attitudes towards sports and exercise, as did 59% of participants in the IE condition and 75% of participants in the BTN condition. At post-intervention, 65% of participants in the control condition, 90% in the IE group and 95% of participants in the BTN condition viewed sports and exercise positively at post-intervention. At 8 week follow-up 13 out of the 14 individuals in the BTN condition, all 10 individuals in the IE condition, and 5 out of 9 participants in the control condition reported positive attitudes towards sports and exercise.

The themes 'healthy body and mind', 'de-stress' and 'social interaction' emerged from the analysis of participants' responses to the question related to the benefits of exercise. At pre-intervention 9% of participants in the control group describe involvement in exercise as being socially beneficial, this is comparable to 8% and 11% of participants in the IE and BTN conditions respectively. At post-intervention only 12% of participants in the control condition and 9% of participants in the IE condition continued to discuss the benefits of exercise in terms of social interaction. On the other hand, the number of individuals who indicated that social interaction was a benefit of exercise increased to 21% in the BTN condition. At 8 week follow-up 20% and 21% of participants allude to the social benefits of exercise participation in the IE and BTN conditions respectively, compared to 11% of those in the control group.

## Discussion

The efficacy of exercise interventions for depressive symptoms in young men is a key finding from this study, with pre to post depression scores decreasing by 52% in the IE condition and by 45% in the BTN condition. The finding that both exercise interventions resulted in significant decreases in depressive symptoms at five weeks also provides additional insight into the temporal relationship between the effects of exercise on well-being. Specifically, the temporal course of change for depression in both exercise conditions in this study is similar to that observed for other psychotherapeutic treatments for depressive symptoms (Wilson, 1999). In terms of duration of change, both quantitative and qualitative results suggest that the benefits of exercise for depressive symptoms have the potential to persist beyond the end of treatment. These findings support and extend previous research by showing the efficacy for different types of exercise based interventions on depressive symptoms in a non-clinical sample of young men.

Although both the individual exercise and BTN interventions demonstrate the value of exercise for depression, further exploration of the BTN programme is merited for several reasons. Mental health interventions targeted at males cannot make an impact unless young men are willing to engage and adhere to these programmes. The BTN programme was designed to address help-seeking barriers specific to men and consequently provide an avenue for men to avail of support without feeling embarrassed. A positive feature of the BTN programme was the delivery of a mental health intervention in a socially acceptable venue employing both cognitive behavioural strategies and the physical game of football to engage participants. In terms of clinical significance, because the BTN programme is a combined exercise/psychosocial intervention, it is plausible that the mechanisms through which it has an effect on

depression may be different to an exercise only intervention. Further research is needed to explore the mechanism of change in the BTN intervention. This should include both short term and longer term assessment of other clinically relevant variables such as perceived competence, problem solving and interpersonal skills.

Given that the BTN condition was designed to facilitate social support it was surprising that individuals in the BTN condition perceived less social support than the IE group at 5 weeks. Further, contrary to our expectations it was the IE condition and not the BTN condition that showed significantly greater perceived social support than the control group at 8 week follow-up. Because participants in the IE condition were wearing individual HR monitors, researchers had significant one to one interaction with participants to check heart rate intensity and safe use of equipment. On the other hand, one to one interaction between researchers and participants in the BTN condition was less frequent because participants were wearing HR monitors that were part of a team system. Therefore, it is possible that the treatment benefits (i.e., increased perceived social support) in the individual exercise condition could have been due to the non-specific effects of one-on-one staff attention and support. A main trial examining the effectiveness of the BTN programme should try to minimize the input of the researcher in the individual exercise condition. The effects of such tighter controls will also be interesting to examine from an adherence perspective.

In terms of future research, mental health reports highlight the importance of exploring the potential of cost effective and openly accessible initiatives to address psychological distress at both the clinical and general population level (National Office for Suicide Prevention, 2008; Russell et al., 2004; Tedstone-Doherty & Kartalova-O'Doherty, 2010). To date we are not aware of any studies that have explored the cost-effectiveness of exercise programmes (i.e. individual versus group) for mental health.

Nor have any studies compared exercise programmes with other interventions in terms of cost. Future evaluation of the BTN programme should also include a comparison of its cost-effectiveness relevant to other types of interventions targeted at men's mental health. This would help to further assess the feasibility of this type of intervention.

There were several limitations to this study. The final sample size was limited and confined to a small urban area. Similar larger scale studies incorporating multisite participant pools from both urban and rural areas would improve generalizability. In terms of the longer term benefits of exercise (i.e., at 8 week follow-up) these findings should be interpreted with caution due to the participant attrition rate. Further research is needed to explore the benefits of exercise programmes over extended periods of time (e.g., 4 month, 6 month and 12 month follow-up). In terms of design, the combination of the group exercise and cognitive behavioural intervention makes it difficult to detect the relative effects of each. A main trial should include a cognitive behavioural only intervention as an additional comparative condition. This would allow for the examination of the adjunctive value of exercise along with the cognitive behavioural intervention.

In terms of recruitment procedures, newspaper advertisements proved the most effective in generating enquiries about the study and may be the optimum method for future research. Adherence to the BTN programme was similar to that of other exercise-based research (Dunn et al., 2005). However, a qualitative exploration of participant's experiences will prove beneficial in refining components of the BTN programme that will maximise retention of participants.

It is argued that distress should be seen a continuum with individuals needing more or less support at various stages in their lives (Tedstone-Doherty & Kartalova-O'Doherty, 2010). Failure to seek help for mental health distress can lead to an

escalation in problems necessitating more intensive treatment in the long-term (Tedstone-Doherty & Kartalova-O'Doherty, 2010). Policy recommendations suggest that mental health prevention strategies need to be gender-specific and targeted at hard to reach groups such as young adult men (Tedstone-Doherty & Kartalova-O'Doherty, 2010). By targeting a community sample of young adult men, the BTN intervention aimed to address male specific help-seeking barriers and equip men with the strategies to cope with minor levels of distress to protect against the escalation of problems. Specifically tailored exercise-based interventions such as the BTN programme therefore have the potential to reach and engage young men in mental health help-seeking. Further research is warranted to examine the effectiveness, feasibility, sustainability and cost of this type of intervention as a first line source of support for this difficult target group.

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## **CHAPTER 3**

**PARTICIPATING IN AN ALTERNATIVE MENTAL HEALTH**

**INTERVENTION:**

**A QUALITATIVE EXPLORATION OF MEN'S EXPERIENCES**

## Abstract

**Context:** The ‘Back of the Net’ (BTN) pilot randomised control trial investigated the clinical effectiveness of an integrated exercise/psychotherapeutic intervention for young men’s mental health. A more comprehensive evaluation of participants’ experiences of the BTN intervention will aid understanding of the randomised control trial results and future programme dissemination.

**Objective:** To qualitatively explore young men’s experiences of participating in the BTN programme.

**Methods:** Nine males who completed the BTN programme participated in a focus group discussion and six males participated in semi-structured individual telephone interviews.

**Results:** The process of participating in the BTN programme was viewed as a positive experience. The BTN programme was perceived as a socially acceptable mental health intervention among this difficult to reach demographic. Participants experienced improvements in coping skills, self-care behaviour patterns, confidence, and attitudes towards physical activity over the duration of the intervention. The BTN exercise environment was viewed as non-judgmental and engaging for young males.

Participants also made recommendations on how components of the intervention could be improved in a future main trial of the exercise/psychotherapeutic programme.

**Conclusion:** To engage young men in mental health promotion and to actively develop strategies for fostering positive mental health combined exercise and psychotherapeutic interventions are effective. Future research should continue to investigate ways in which exercise and CBT strategies can be integrated within mental health promotion programmes.

It is estimated that one in ten adult men will, at some point in their lives, experience a period of depressive symptoms serious enough to require treatment (Mental Health Foundation, 2005). However, research indicates that many young men neglect to seek formal channels of support when experiencing episodes of psychological distress (Oliver, Pearson, Coe & Gunnell, 2005). Social psychology literature suggests that men are reluctant to seek assistance because many of the attributes associated with psychological help-seeking, such as relying on others, disclosing emotional difficulties, and admitting the need for help, conflict with the messages men learn from societal norms about traditional male attitudes and behaviours (Addis & Mahalik, 2003). The idea that gender-role socialisation may create barriers to psychological help-seeking for young men is supported by a number of quantitative and qualitative studies (Begley, Chambers, Corcoran & Gallagher, 2003; Good, Dell & Mintz, 1989; Good & Wood, 1995; Mahalik, Good & Englar-Carlson, 2003). For example, in their sample of undergraduate males, Good, Dell and Mintz (1989) found that degree of endorsement of traditional attitudes about the male gender role (referred to as traditional masculine ideology) was significantly related to negative attitudes and behaviours towards seeking formal psychological help.

It has been suggested that the reluctance of young men to seek help for early experiences of psychological distress can lead to an escalation in problem severity and a need for more intensive treatment (Tedstone Doherty & Kartalova-O'Doherty, 2010). As such, a number of recommendations have been put forward to encourage help-seeking behaviours and to improve mental health among this demographic. These include providing minimal, gender-specific alternative interventions which actively encourage young people to build supportive networks and self-help coping skills (Addis & Mahalik 2003; Biddle, Gunnell, Sharp & Donovan, 2004; Jorm, 2000; Rickwood,

Deane, Wilson & Ciarrochi, 2005; Tedstone Doherty & Kartalova-O'Doherty, 2010).

In light of these recommendations, 'Back of the Net' (BTN) a 10 week pilot programme was developed to provide a minimal health intervention specifically targeted at a non-clinical community sample of young men.

Integrating a cognitive behavioural intervention within a team sport setting, the BTN programme aimed to increase perceived social support and decrease symptoms of depression in a community sample of young males. To examine its effectiveness in meeting these aims, a multi-method approach was employed. Quantitative methodology (i.e., a Random Control Trial, RCT) was initially used to compare the BTN programme with an individual exercise and a control condition. Quantitative results showed that men participating in the BTN programme reported a significant decrease in depression scores over the 10 week period. An increase in perceived social support was also reported although findings failed to reach statistical significance. Empirical findings were therefore encouraging in demonstrating the potential of the BTN programme in improving the mental health of young men [see McGale, McArdle & Gaffney (2011), for a full description of the study methodology and results]. The aim of the current study was to employ focus group and individual interview methodology to qualitatively explore the way in which the participants perceived, understood, and experienced the BTN intervention. It was hoped that the results from this study would give some insight into programme implementation and acceptability, and provide further understanding of the RCT results.

The BTN intervention involved active participation in football training sessions in which cognitive behavioural strategies were employed to develop perceived social support, problem solving abilities, and general stress management and coping skills. Cognitive behavioural strategies have proven to be beneficial in addressing indices of

mental distress including depressive symptoms and perceived social isolation (Brown et al., 2005). Similarly, involvement in sports is also considered a constructive method of protecting against depressive symptoms and providing increased social support (Boone & Leadbeater, 2006; Tomori, Zalar & Plesnicar, 2000; Russell, Gaffney, Collins, Bergin & Bedford, 2004).

The BTN framework permitted the entire content of each training session, including team drills and games as well as group discussions to be dictated by various mental health 'themes'. The themes addressed in the pilot RCT included relaxation, teamwork, identifying positive strengths, goal-setting, problem solving, resilience, avoiding harmful situations, self-care behaviour and communication skill building. To address each of these themes in a way that would be socially acceptable to young men, football metaphors were employed as a means of initiating discussion, facilitating group support and fostering personal learning.

Mental health interventions cannot make an impact unless young men are willing to engage and adhere to these programmes (Burke & McKeon, 2007). Therefore, in terms of the viability of the BTN programme, it is important to understand participants' perceptions of their experience. Mitchell and Branigan (2000) recommend that focus groups are an ideal method for understanding how participants experience and perceive health promotion interventions. A key feature of focus groups is the interaction among participants which is used to generate data (Webb & Kevern, 2001). In the current study, exploring the relationships among participants within a focus group context is particularly useful as one of the main objectives of BTN was to develop rapport and social support among the men. Individual interview strategies permit individual's experiences and understanding of interventions to be explored in more depth and therefore compliment focus group discussions (Oakley et al., 2006).

Specifically, by using a semi-structured interview format, one-on-one interviews allow participants sufficient flexibility to discuss their experiences in their own way (Matthews & Ross, 2010). Employing qualitative methodology in conjunction with randomised control trials allows for the evaluation of change processes throughout the trial and a more in-depth understanding of participants' experiences (Beattie, Shaw, Kaur & Kessler, 2009; Laberg, Tornkvist & Andersson, 2001; Mason & Hargreaves, 2001; Smith, 1996). Qualitative methodology is also often used for programme development (Krueger & Casey, 2009) and is particularly well suited to evaluation of the process of cognitive based interventions (Mason & Hargreaves 2001; Mitchell & Branigan, 2000).

Employing semi-structured interviewing strategies in one-on-one interview and focus group settings this study explored participants' subjective experiences of the process of participating in the BTN programme. This qualitative exploration of men's experiences included an investigation of participants' perceptions of (i) the perceived acceptability of the BTN programme, (ii) the way their lives changed as a consequence of the intervention, and (iii) those treatment components experienced as positive or negative.

## Method

### *Intervention*

The BTN programme ran over a period of 10 weeks during which time participants were encouraged to attend a maximum of 20 BTN sessions. Each BTN session was implemented by a facilitator and a football coach and consisted of active engagement in a 55 minute five-a-side football training session. Sessions were designed



so that players exercised to moderate heart rate intensity for at least 35 minutes. This included participating in a 10 minute warm-up, 5 minute football drills, a 10 minute conditioned game and a 25 minute five-a-side match (including a 5 minute half time team talk) followed by a 5 minute warm-down. Warm-ups, drills, conditioned games and the half time team talk were tailored to incorporate the weekly mental health theme. Emphasis was also placed on integrating cognitive behavioural techniques throughout each session to develop personal coping skills. For example, guided discovery employing football metaphors was used to engage participants in the half time team discussions and address the weekly mental health theme. The use of football metaphors was particularly important in engaging the group and encouraging the men to share their personal experiences of the weekly theme. The use of key words, homework tasks and post-session refreshment and snacks reinforced the main objectives of each theme. The protocol of each BTN session was documented and study integrity was checked by an independent observer.

### *Participants*

Completion of the BTN programme was the only criterion for eligibility. From those participants who completed the BTN intervention ( $N = 23$ ), a convenience sample of 15 men (65% of completers) aged 23-35 years were recruited (see Table 3.1). Participants who attended the focus group discussion are referred to as F1, F2, F3, F4, F5, F6, F7, F8 and F9 and those who participated in the one-on-one interviews are identified as I1, I2, I3, I4, I5 and I6 in this study.

Table 3.1.

## Participant Characteristics

Participant	No. BTN sessions attended	Age	Exercising prior to BTN	Ethnicity	Employed	Marital Status
F1	20	30	no	white	yes	single
F2	16	32	once p/w	white	yes	married
F3	12	32	once p/w	white	yes	married
F4	19	29	once p/w	white	yes	single
F5	18	28	no	white	yes	single
F6	18	26	no	white	yes	single
F7	15	35	no	mixed	yes	single
F8	14	26	once p/w	mixed	yes	single
F9	14	23	once p/w	white	no	single
I1	19	35	once p/w	white	yes	married
I2	10	34	no	white	yes	single
I3	13	24	no	white	yes	single
I4	20	26	no	white	no	married
I5	18	34	once p/w	white	yes	married
I6	16	28	no	white	yes	single
Total <i>N</i> = 15	mean (SD) 16.13 (3.07)	mean (SD) 29.47 (4.03)	% sedentary 53	% white 87	% employed 87	% single 67

Abbreviations: p/w, per week

### *Procedure*

Upon approval of the authors' institutional Human Subjects Review Board, participants were contacted post intervention by e-mail and/or telephone, informed of the nature of the research project and asked to participate. Nine participants were initially asked to attend a focus group session and six additional participants were later recruited to participate in individual interviews. All those contacted agreed to participate in the study. Before taking part in the focus group or individual interviews, participants were given an information sheet outlining the details of the study and a consent form to complete. Participants were assured that their responses would be strictly confidential and data would be analysed as group data only.

The focus group was conducted in a quiet room at the university sports complex; to facilitate group interaction participants were seated around a table. One of the research facilitators for the BTN programme acted as moderator for the focus group session. The moderator emphasised that all feedback including criticisms of the programme were welcomed and would be treated with confidentiality. Participants were provided with a handout that outlined the theme and overall aim for each week of the intervention. This handout was used as a reference point for discussion topics throughout the session. The focus group session lasted 1 hour 15 minutes.

To elicit specific information and steer group discussion throughout the focus group session the researchers developed a topic guide that acted as a prompt for the moderator. In the focus group session participants were asked a number of predetermined open-ended questions covering the topics presented in the guide. These questions were developed for the purposes of exploring participants' experiences of the BTN intervention. Following from preliminary analysis of the focus group data the topic guide was developed to include additional topics that the researchers felt

warranted further exploration in the individual interviews. All six individual interviews were subsequently conducted via the telephone and participants were asked a number of predetermined open-ended questions covering the topics presented in the guide.

Interviews ranged between 13 to 31 minutes in length. While the use of a topic guide provided structure to the discussion, it also allowed for flexibility in the interview process and depth of exploration. The overall topic guide covered:

1. Experiences of the BTN programme
2. Perceived gains from participating in the BTN programme
3. Perceptions of the intervention process
4. Perceptions of the BTN environment
5. Perceived acceptability of the BTN programme among men

#### *Data Analysis*

In analysing the focus group and interview data, a thematic analytic approach within an essentialist framework was followed to report on the experiences, meanings and reality of the participants (Braun & Clarke, 2006). Initial data analysis began following the focus group session and newly identified themes were explored further in subsequent interviews. For the focus group discussion and all the individual interviews audio recordings were transcribed verbatim. To assist analysis the researcher included any relevant observational notes that were made throughout participant interviews. This is particularly beneficial when conducting focus groups as it allows for data relating to group dynamics to be included in analysis (Webb & Kevern, 2000). Two researchers independently analysed the qualitative data. Initially researchers familiarised themselves with the data by listening to the audio recordings and reading transcripts. Analysis was both deductive and inductive. Specifically a deductive approach was

employed to develop an organising framework and an inductive approach was used to develop codes and recognise new concepts/themes emerging from the data (Gibbs, 2007). Higher order themes were developed by comparing and contrasting codes within the data and classifying similar codes together (Kruger, 1994). Data was systematically analysed until no new themes emerged (Strauss & Corbin, 1998).

To increase the validity of the results in both the focus groups and individual interviews, participants' responses were summarised by the researcher during and at the end of each session to give participants the opportunity to clarify any misunderstanding in interpretation. To further ensure trustworthiness, member checking was employed post qualitative data collection (Krueger & Casey, 2009). The researcher presented back a summary of the main findings to 5 out of the 9 individuals from the focus group and to all 6 participants who were involved in the individual interviews. This allowed participants the opportunity to verify summary comments. Methodological triangulation, namely (i) the use of multiple investigators, (ii) the use of both focus group and individual interviews, and (iii) negative case analysis was also used to increase reliability and validity (Flick, 2007).

## Results

In describing both individual and collective experiences of participating in the BTN programme, three major themes emerged, namely (a) 'The BTN Experience', (b) 'Perceived impact of the BTN programme', and (c) 'Programme development'. Each of the major themes and the related sub-themes that emerged from the discussions are presented below.

### *The BTN Experience*

This theme refers to the ways in which the men experienced participating in the BTN programme. Participants reflected upon how the BTN programme addressed issues relating to the help-seeking behaviours of young men and their experience of football as the context for mental health promotion. Participants also discussed how the BTN experience compared to the expectations they held prior to taking part in the intervention. Participants' experiences of the BTN intervention are summarised into four sub-themes, (a) Men and help-seeking, (b) Help-seeking and the BTN programme, (c) Sport as a vehicle for mental health promotion, and (d) Actual versus expected experience.

#### *Men and Help-Seeking*

Participants recognized that men are reluctant to actively seek help for personal problems. A number of participants indicated that they had privately reflected on this phenomenon and discussed it with other male friends. Views on help-seeking expressed by men participating in the focus group were supported by those who participated in the individual interviews. In sum, participants attributed the difficulty that young men experience in talking about problems to embarrassment and social expectations of the traditional male role in Western culture.

This is what we have all been brought up with and told that, 'You are a man, suck it up and get on with it, big boys don't cry', and I have no doubt that this is why male suicides are so much higher than female suicides, and that's because men are always told, as if it's an embarrassment that you have a problem, you don't talk to your mates about it, and you just get on with it. (I1)

I think it's a cultural thing, men see it as a sign of weakness to say that they have a problem, it's a cultural thing, its an in-built thing, women like to talk and get things out and share emotions with each other but men feel that they are afraid to do it in case they are ridiculed... men are suppose to be strong and not have any problems and so if they do they just say 'Right I'm going to deal with it myself instead of telling somebody and being ridiculed and laughed at.' (F3)

### *Help-Seeking and the BTN programme*

Participants described the sporting context of the BTN programme as making it easier for them to talk about problems. The men felt that the environment that was created throughout the BTN programme was conducive to opening up and talking about issues that they would not otherwise discuss with friends. Part of the attractiveness of the BTN programme was that the men did not know each other prior to starting the programme. This permitted the men to talk openly about personal issues as they felt that everyone was attending the programme for the same reason and would therefore be non-judgemental about the issues under discussion.

Well myself and (F1) for example, who wouldn't have known each other before, we would have told each other a few different things and I would know a lot about him and him about me now and probably because we didn't know each other then nobody is going to be judgemental or no one is going to have a pre-conceived opinion you know... I think it was that element that these are strangers... it's almost like going to a counselling session you know, you're telling a stranger but added to that you got the friendship end of it. (F3)

### *Sport as a Vehicle for Mental Health Promotion*

The men reflected that participation in the programme made them feel as if they were part of a team that were purposefully being developed both physically and mentally. For example, participant I1 expressed that the programme would not have been successful without using sport as the context for delivery:

I think having football as the context makes it a bit easier (to discuss mental health issues). Certainly, for example, the team talks, I think we had the opportunity, I think it give people the feeling that there was a support group out there for them. But, I think if you just took everyone, without the football element and stuck them in a room it wouldn't work because with football you can be a bit more relaxed. (I1)

### *Actual versus Expected Experience*

A number of the focus group and individual interview participants described their experience of participating in the BTN programme as being different to what they had expected prior to starting the study. In particular, participants expressed being pleasantly surprised by the variation in warm-ups, drills and games offered throughout the sessions, participant F3, "It was more enjoyable than I expected it to be, I thought play an hour of ball, I didn't realise the warm-ups... it probably added to it." Many of the participants reported that the addition of CBT strategies to the football sessions was not in keeping with their expectations of involvement in the study. Participant I4 discusses his expectations and experience in the following quote:

I thought it was totally different and it was different because you taught me different things not just about football but about health... you didn't just teach me football things like skills and fitness but you taught me about, em, self-



development and I learned that you can improve your performance on the field and also in your life.

### *Perceived Impact of the BTN Programme*

The perceived impact of the BTN programme emerged as a very salient experience for the men who took part in this study. Throughout the focus group and individual interviews, participants made many references to how their participation in the BTN programme was perceived to have impacted on their lives, both collectively as a group and individually. Specifically, a number of participants involved in the focus group described their own experience of the impact of the programme in terms of a shared team experience. Participants' perceptions of the ways in which participating in the BTN programme had impacted on aspects of their lives are summarised into five sub-themes, (a) Development of life skills, (b) Personal insight, (c) Changes in beliefs and attitudes, (d) Changes in behaviour, (e) Perceived social support, and (e) Enjoyment and positive affect.

#### *Development of Life Skills*

Many of the participants indicated that how they thought about stressful events had changed and consequently they now felt more equipped to deal with adverse situations. In particular, one participant described that he was aware how his coping skills had improved over the course of the BTN programme. Participant F1 spoke openly during the focus group discussion about his experience of going through a significant relationship break-up while participating in the programme. He felt that the group discussions were supportive and skills developed during the sessions (e.g., de-stressing techniques, conflict management and communication skills) helped him manage the situation more effectively. In the following quote participant F1 provides

an example of how he was able to transfer skills learnt through the programme to a personally stressful situation:

Usually you just want to lash out at her, verbally, never physically, but I did, I took time to myself and then just go back and say (to her) 'have you calmed down yet, lets talk.' You know, I would de-stress and get the head together.

In addition, the participants reported that learning from others throughout the team talks was a positive and worthwhile experience. Participants also spoke about how they continued to think about issues discussed during the sessions in their day to day lives.

I did actually put it into my head and self-use at home like and (it) got me through some hard times in the last few weeks... Like it was good to get things as a group, talk about them and say like, this is how you bounce back like, and everyone give an example, like one of the lads give an example that someone had spat on him, at the airport, like hearing stuff like that its good to know how other people handle situations. (F1)

### *Personal Insight*

Many of the participants discussed becoming aware of how their thought processes and subsequently their actions changed as a result of their involvement in the programme. In particular, many of the men commented how they learned to prioritise themselves and their own well-being within their daily lives.

The one thing that stressed me out most in life was my football team but I quit managing two weeks ago, so I did realise that I don't need to be, I don't need to look after everyone, I can just do whatever I want...I just want to be one of the boys again, not have the stress of having to do everything...and maybe I got that here. (F9)

Maybe I think that it is not always manly to talk about feelings but, eh, I realise now that talking about it actually helps you, it's great to talk to a friend or anybody who is listening. (I4)

### *Changes in Beliefs and Attitudes*

Participants involved with the focus group and those who participated in the individual interviews identified changes they observed in their attitudes towards physical activity and patterns of physical activity over the course of the programme. Participants describe how prior to starting the programme they were uncertain about their ability to become involved with and enjoy an exercise programme. Indeed many of the men stated their motivation for signing up to the programme was a desire to improve their fitness levels. The men indicated that over the duration of the programme, they noticed that their attitude towards exercise became more positive and they began to see the benefit of integrating exercise into their lives. For example, participants commented "I'm more positive towards it (exercise)" (F8); a sentiment shared by others:

Certainly I was a lot more positive than before I started, I suppose that was because it was always something to look forward to... I still look forward to going to the gym as I know I will get great benefit from it. (I1)

Together with changes in attitudes towards physical activity, a prevalent theme that emerged throughout the focus group discussions and individual interviews was the perception of improved exercise self-efficacy as a result of participating in the BTN programme. Self-efficacy is a person's level of confidence in their ability to perform particular behaviours (Bandura, 1997). In the physical activity context, exercise self-

efficacy refers to the confidence one has in their physical ability to perform activities. Participants reported experiencing increased levels of self-confidence in their fitness and physical ability to partake in drills and games, for example, the experience of participant I4 illustrates this point, “In my fitness and in my skills I was thinking all the time when I was playing that I was better and fitter than the last week, it was good... it give me this confidence.” The men described observing the development of exercise self-efficacy in themselves, in other players, and in the team as a whole, “The lads got more comfortable... more confident if you like.” (I2)

Yeah confidence... my first week here I couldn't kick a ball, I was falling over and I was getting angry at myself but then I realised I'm just here to get fit, I wasn't here to play football but I am going back playing now next week. (F9)

#### *Changes in Behaviour*

Throughout the individual interviews and focus group discussion participants spoke about experiencing changes in their behaviour patterns. For example, participants expressed how they developed an awareness of the factors that impact on well-being and how this in turn helped them to better manage various aspects of their lives.

From a time management point of view, all of a sudden I went from going into work at 7 in the morning, leaving 6, 7, 8 o'clock at night, eating, going to bed, getting up, doing the same thing every day and all of a sudden now I'm leaving at 5 o'clock, I am just managing my time better because I realise that I can actually do it, I can get out early, I don't have to be working there all the time. (F2)

Participants also specifically commented on how their physical activity behaviour patterns changed due to improvements in fitness. Participants reflected on how they

noticed their day-to-day behaviour change as a result of increased fitness and enjoyment of physical activity. For example participant F1 stated, “I don’t mind walking to the shop now, it’s just around the corner you know, but usually I’d have sent the kids.”

This was supported by other participants involved in the focus group:

Yeah, more energy to do other things, so as well as, you know, feeling fitter, you get home on another day from work and you say, ‘Right, I’ll do this bit of painting that she’s been at me about, I’ll go out and do it,’ whereas before it was, you know, it was the same routine. (F3)

The majority of participants involved in this qualitative study reported feeling disappointed that their involvement in the 10 week programme had ceased.

Consequently, a number of the participants organised amongst themselves to continue playing five-a-side football together on a weekly basis.

I don’t think anybody wanted it to end... we were sad it was ending and wanted to keep it going, which we have thanks to (F1), he’s organised the football very well. (I’m) just coming back from it this evening actually so it’s kept going so I think that alone reflects on how successful the whole programme was. Normally you have the numbers die away very quickly. (I2)

### *Perceived Social Support*

All of the men who participated in the focus group and interviews spoke about their perceptions and experiences of social support throughout the BTN programme.

Many of the men expressed feeling valued as team members, having feelings of responsibility towards the team and not wanting to let their team-mates down. It was evident that friendships had developed among many of the players. Certainly, this was

the experience of one participant who had moved to Ireland a number of years previous to participating in the BTN programme:

I had no friends, not many friends and no family here. My wife is Polish also and I was looking to meet people to talk to, to interact and off course playing the football helped that. Look, I have (F1) and he is my buddy from there, and (F8) he is my friend also so I have friends now. (I4)

The social aspect of participating in a group sport was perceived as an important factor in encouraging the men to partake in the programme. Participants made a case that an individual exercise programme, such as exercising in a gym, would not have been as sociable or enjoyable as a team based sport. All of the men interviewed agreed that when exercising in a gym “You wouldn’t talk to anyone” (F9).

In the gym I feel very good, purely from the high from doing the exercise but it doesn’t have the same feeling as the football programme... it’s not the same as the whole bonding thing that came along with the football. I think that having that team bonding was huge. (I1)

#### *Enjoyment and Positive Affect*

Throughout the focus group discussions and individual interviews all of the men repeatedly spoke about their participation in the BTN programme in terms of experiencing enjoyment and fun. For example, in discussing the strengths of the programme, participant I5 spoke about the enjoyment and positive affect he experienced:

It was great, I really enjoyed it... the enjoyment mixing with the lads that I had never met before and the craic (fun) we had, great enjoyment I got out of it and

then the good feeling that you got when you were leaving, you definitely get that buzz... I felt great afterwards.

### Programme Development

As participants spoke about their first-hand experiences of participating in the BTN programme they reflected upon positive aspects of how the BTN programme was organised as well as recommending changes to the programme to aid future refinement of BTN. Three sub-themes emerged related to (a) Structure of the BTN programme, (b) Implementation of the BTN programme, and (c) Refining the BTN programme.

#### *Structure of the BTN programme*

Participants commented on the structure of sessions as well as their experience of how the programme was structured overall. Most participants liked the manner in which the programme was organised, for example participants commented, “The structure was brilliant” (F2) and “I think it’s a good format it’s a good game of ball and just throw in the few things to get people thinking you know.” (F3) Participants described the structure of the sessions as motivating and supportive. In particular, participants conveyed that their enjoyment of the BTN programme stemmed from how the sessions were organised and the inclusion of the various warm-ups and drills.

The best thing was the way you structured it... I thought that was really good, I mean I have played five-a-side with lads before but I thought the (BTN) warm-ups and drills and everything was really good... without the structure I wouldn’t have enjoyed it as much, it would have become the usual five-a-side team where suddenly people started taking it seriously and its not enjoyable anymore. (I1)

I was really motivated for coming up, I don't know, it was just the way you organised it, it just made me want to come up every time. I usually start something and em, you know, I might do a couple of weeks of it and then that's it, like go to the gym and get two or three good weeks out of it and that's it... but I think with this like, I reckon I could keep going for a year. (F8)

### *Implementation of the BTN programme*

Throughout the focus group and interviews participants attributed their positive experiences, such as increased feelings of confidence and enjoyment to various aspects of how the BTN programme was implemented. For example, a number of the men involved in the programme indicated that the atmosphere created in each of the sessions provided a 'safe place' for fostering confidence. A consensus among participants was that they found the BTN environment to be friendly and non-competitive. For example one participant expressed his experience of participating in the BTN programme in the following terms, "There's nothing competitive about it... no-one says anything to you here, like it's not like that, its great, you know, your not put under pressure." (F8) Participants also discussed how the BTN environment was not only perceived as conducive in fostering confidence and acceptance but that it provided a constructive distraction from day-to-day stress.

What I took out of it was, I do be fairly busy at work and I play in a band as well so all my time is gone, the important thing I found is that its important to do something you enjoy, that will de-stress you. Have an hour or two doing this, it keeps you healthy, keeps you fit and you forget about everything else, you forget about what you had to do yesterday, what you have to do tomorrow, you have your own space and your own happiness here for a couple of hours a week. (F6)



Participants discussed that they perceived the role of the facilitators as significant in fostering the friendly atmosphere and implementing team development and feelings of being valued as team players, “The way (facilitator) done it was like, he was training a football team cos the stuff he was doing like, it was like he was training us to be a team.” (F9) A view shared by others, “(Facilitator) was good cos he made sure everybody was involved.” (I3)

### *Refining the BTN programme*

In terms of changes to the BTN programme, participants felt that the time allocation to each session could be longer. For example participants remarked “I could have done with an extra half hour because there was a lot to squeeze in.” (I2), and “I would have been happy with an hour and half... there was never a time when everyone was knackered and (had to) stop. If there had of been another half hour everyone would have been happy to keep going.” (I1)

A number of the men felt that in some cases the team talks were too long and consequently they got ‘cold’ and lost interest, “At a half time break you need a breather but sometimes it was going on for a bit long and you could feel yourself getting cold and tired and you just wanted to go back out and run again.” (F9) Another recommendation was that in some instances that team talk would have been more beneficial at the start of the session rather than during the half time point of the game. For example, one participant described how he would have preferred the sessions to be organised:

Set the scene at the start and then do a follow through maybe at the end so you can deal with what we started at, and then what we have done in the exercise and then at the end, more of a natural progression. (F2)

Participants also identified weeks where they felt the implementation of the theme could be improved. For example for the theme 'Identifying Positive Strengths' participants could not grasp the point of some of the exercises used to implement this theme. As one participant explained, "Picking up the cards was a bit weird cos you didn't know what to pick." (F9)

In discussing the context of the BTN intervention some of the men participating in the focus group commented that they were sometimes too focused on football to appreciate the team talks. Participants F2 and F3 questioned whether they would have benefited from talking about some issues in a classroom (or locker room) scenario rather than addressing all the topics on the football pitch. Participant F2 suggested, "If you had have done eh, a classroom scenario, at day 1, a classroom scenario half way through and a finalised shut-down class... it would have been interesting to monitor how things progressed" and this was supported by participant F3 "(talking about game tactics) is wasted on us in a classroom setting and I think the reverse is true, in that, it was kind of wasted on the football field, the life chat."

## Discussion

This study explored participants' experiences of a 10 week pilot community mental health intervention (BTN) specifically targeted at young men. The qualitative results presented not only allow for a holistic evaluation of the programme but they also provide further depth of understanding to the initial quantitative assessment of the BTN programme (see McGale, McArdle & Gaffney, 2011). An important finding from this study is that sport (in this instance, football) was successfully utilised as a method to engage young men in a community based mental health intervention. More specifically, participants described partaking in purposefully structured football sessions and the use of sporting metaphors to initiate discussion around mental health topics as acceptable strategies for mental health promotion with this population. The opinions of the community sample of men who participated in this study supports existing research into male attitudes towards help-seeking (e.g., Begley et al., 2003; Biddle et al., 2004; Möller-Leimkühler, 2002; Tedstone Doherty & Kartalova-O'Doherty, 2010). For example, consistent with masculine gender-role socialisation literature (e.g., Addis & Mahalik, 2003), participants in this study felt that prevalent social and cultural expectations of male behaviour acted as barriers to help-seeking. Participants further disclosed that for men needing emotional support was associated with feelings of stigma and embarrassment. However, participants recognised both the need for support services for young men and the lack of such services in the community. Both individually and collectively participants expressed the view that the BTN programme was a viable, socially acceptable source of support for young men. This demonstrates the acceptability of combined exercise/CBT interventions such as the BTN among its target demographic. Investigating the acceptability of innovative mental health

programmes such as the pilot BTN intervention is an important aspect of developing new therapies (Mason & Hargreaves, 2001).

In terms of the effectiveness of the BTN intervention in improving mental health among young men, participants discussed their experiences of learning life skills such as stress and conflict management, communication skills and self-care behaviours throughout the BTN programme. Participants felt that learning from others in a group context was particularly beneficial in allowing them to learn skills that they could self-use within their broader day-to-day lives to deal with distressing situations, such as difficulties with inter-personal relationships. An interesting finding is that participants recognised the ways in which sport was utilised to facilitate learning and change among the group. Participants reported placing increased value on the importance of prioritising mental and physical well-being and implementing this into everyday life as an important outcome of the BTN programme. For example, participants described how they felt better equipped to manage their emotional well-being and this was evidenced by the changes they implemented into their daily lives to reduce stress. The finding that participants were more focused on personal well-being is consistent with research investigating the experiences of those participating in small-sided football training sessions. McElroy, Evans and Pringle (2008) found that mental health service users similarly developed an acute awareness of the mental health benefits of maintaining a healthy physical lifestyle as a result of their involvement in a six-a-side football league. In this study, a salient finding was that participant's beliefs, attitudes and behaviours towards engaging in exercise changed as a result of taking part in the BTN intervention. Specifically, participants became more positive towards exercise and felt encouraged to integrate physical activity into their broader everyday lives. Stemming from increased self-confidence in their physical fitness and skill ability, a

number of participants increasingly incorporated physical activity into their daily routines and many reported becoming involved in structured exercise sessions.

The focus group discussion and individual interviews revealed a number of components and strategies of the BTN programme which were perceived as successful in engaging young men in a mental health initiative. Importantly participants attributed the environment created throughout the BTN programme to fostering increased feelings of social support. Participants provided examples of feeling valued as team members and forming supportive friendships which translated into their everyday lives. Subjectively participants felt that the programme fostered feelings of social support and that this contributed to motivation, enjoyment and adherence. The fact that many of the completers of the BTN expressed their disappointment at the programme coming to an end and had resolved to continue exercising as part of a structured group is testament to this. The finding that positive, socially supportive experiences are conducive to adherence within structured exercise programmes is consistent with previous qualitative research in this area (Crone & Guy, 2008; Crone, Smith & Gough, 2005; Hardcastle & Taylor, 2001). The socially supportive and accepting environment that was created throughout the BTN intervention was also presented as an explanation for the increased exercise self-efficacy experienced by players and overall enjoyment of the programme. In respect to the acceptability of the BTN programme the vast majority of participants perceived the exercise based context encompassing BTN as an enjoyable and engaging activity.

Employing qualitative methodology in conjunction with the pilot RCT (McGale et al., in press) has many benefits. Qualitatively examining the processes of change as experienced by the participants receiving the intervention strengthens the overall research design of the pilot BTN study, maximising depth of understanding (Oakley et

al., 2006). As recommended by Oakley and colleagues (2006) both individual interview and focus group discussion strategies were purposely selected in this study to aid process evaluation. Therefore, in terms of research design, the methodological triangulation strategies implemented in this study improve overall quality of research into the acceptability and effectiveness of the BTN intervention. Qualitative research methods are increasingly utilised in conjunction with RCTs in therapy development as they allow for a thorough understanding of both the psychotherapeutic process as experienced by the participant and the acceptability of an intervention (Donovan et al., 2002; MacCormack et al., 2001; Mason & Hargreaves, 2001; Mays & Pope, 2000). In this study, a qualitative process evaluation of the BTN programme was successful in encouraging participants to describe their experiences in terms of what they have learned over the course of the programme and how their attitudes, behaviour and fitness changed as a result of attending the sessions.

A number of methodological limitations within this study must be recognised. The aim of this study was to investigate the experiences of those participants who completed the BTN programme; participants involved in the other arms of the RCT were not interviewed. Therefore, the experiences of participants involved in the comparative individual exercise and control conditions have been excluded as have the perceptions and experiences of those who declined to participate in the trial. It is recommended that when integrating process evaluation within RCT's that qualitative data should be collected from all intervention and control sites (Oakley et al., 2006). Participants involved in this qualitative research were representative of completers of the BTN in terms of age and average number of sessions attended. However this study is limited by including those participants who completed the BTN intervention. It could be argued that the participants who adhered to the 10 week programme found it more

enjoyable and experienced it more positively than those who dropped out. Therefore the results of this qualitative evaluation are potentially positively biased as the experiences of non-completers are neglected. It would be beneficial for future evaluation of the programme to include the views of participants who failed to complete the intervention in order to capture perceived negatives associated with the BTN programme. Finally, the individual interviews and the focus group discussion were moderated by the same researcher who acted as a facilitator in implementing the pilot BTN programme. The researcher was therefore known to the participants and the possible influence of social desirability in the participant's responses must be acknowledged. To minimise the possibility of desirability bias in participants responses the researcher clearly emphasised the importance of critical feedback. The employment of individual interviews in conjunction with focus groups also allowed for the expression of opinions that may or may not have been expressed in a group context.

These qualitative findings of participant's experiences of the pilot BTN programme, together with empirical findings from the RCT, will aid future dissemination of the BTN intervention. Given that the pilot BTN programme was perceived as attractive avenue of support and effective in improving mental health among young men, a main trial for the BTN should continue to address help-seeking and mental health promotion using combined exercise/CBT based interventions. A future main trial of BTN should consider and implement the suggestions for programme improvement made by participants in this study (e.g., longer session duration, opportunity for CBT guided components delivered off the pitch but still within the context of an exercise programme). Participants also make a number of recommendations regarding the themes that were addressed throughout; helping to clarify issues that are relevant to young men and how facilitators could better address

such topics in future initiatives. A key finding from this study was that the men responded positively to the use of football metaphors and terminology to discuss mental health issues. Research should continue to explore the usefulness of sport as a metaphor for life in future mental health promotion initiatives as well as other therapeutic settings.

## Conclusion

To summarise, the men who completed the BTN intervention largely reported positive experiences from their participation in the pilot phase of the programme. In particular, the sports context utilised within the BTN was perceived as central to the success of the programme. Participants felt that the programme provided a socially acceptable avenue of support where they learned skills and had the opportunity to discuss difficulties. This qualitative analysis supports the main clinical results observed in the RCT as well as providing a more in-depth understanding of participant's experiences. Future research should consider ways in which combined targeted interventions are most effective for delivering community based mental health promotion using an outlet that is perceived as acceptable and appropriate for young men.



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## **CHAPTER 4**

# **EXPLORING THE EFFECTIVENESS OF A COMBINED EXERCISE/INTERNET DELIVERED CBT INTERVENTION FOR YOUNG MEN'S MENTAL HEALTH**

## Abstract

**Objective:** To explore the effectiveness of a combined exercise and internet delivered psychotherapeutic intervention for young men's mental health.

**Design:** 10 week randomized control trial comparing a *combined* exercise and internet-delivered Cognitive Behavioural Therapy (E+*LifeFit*) intervention with an exercise only (E) intervention, a CBT internet-delivered only (*LifeFit*) programme and a control (C) condition.

**Methods:** One hundred and thirty-six sedentary young men were recruited and randomly assigned to one of four study conditions. The exercise intervention consisted of aerobic and resistance training in the university gym. The '*LifeFit*' intervention comprised an interactive sports-based CBT programme and an electronic discussion forum. Those in the combined condition participated in both interventions; the control group refrained from exercise. Participants completed the Beck Depression Inventory-2<sup>nd</sup> Edition (BDI-II) and the Social Provisions Scale (SPS) at baseline, week 5 and post-intervention. Participants who participated in the *LifeFit* intervention completed a short qualitative questionnaire at post-intervention to aid programme evaluation.

**Results:** Participants in both the combined E+*LifeFit* and the E conditions experienced significant reductions in depressive symptoms compared to the control group at post-intervention. Perceived social support increased for the combined E+*LifeFit* condition over time.

**Conclusion:** Exercise on its own is sufficient in significantly reducing depressive symptoms among a community sample of young men and should be further pursued as a standalone therapy option for this demographic. Future research is also warranted to further explore the potential of *LifeFit* as a mental health promotion strategy.



Young adult men are particularly reluctant to approach professional mental health services unless severely distressed (Biddle, Gunnell, Sharp & Donovan, 2004). It has been suggested that men are discouraged from seeking psychological help as a consequence of male gender-role socialisation (Addis & Mahalik, 2003; Good, Dell & Mintz, 1989; Moller-Leimkuhler, 2002; Rochlen, McKelley & Pituch, 2006). From this perspective, the traditional male gender-role is characterised by autonomy, emotional control and self-reliance and men who adhere to these ideologies are less willing to seek psychological help (Addis & Mahalik, 2003; Good et al., 1989). More recently, it has also been argued that endorsement of the traditional male gender-role contributes to feelings of stigma surrounding help-seeking for mental health difficulties (Vogel & Wade, 2009). Concerns about confidentiality and negative perceptions of mental health professionals further act as barriers to help-seeking for young men (Begley, Chambers, Corcoran & Gallagher, 2003; Burke & McKeon, 2007; Rickwood, Deane & Wilson, 2007). Failure to seek support for minor mental health difficulties can result in a need for more intensive treatments at a later stage (Tedstone Doherty & Kartalova-O'Doherty, 2010). For this reason, the negative approach towards help-seeking expressed by males is cause for concern. It is becoming increasingly important to evaluate early intervention strategies aimed at promoting mental health and facilitating self-help skills among men (Cochran & Rabinowitz, 2003; Jorm, 2000; Tedstone Doherty & Kartalova-O'Doherty, 2010). In an attempt to address these challenges, the aim of the present study was to explore the effectiveness of a 10-week combined exercise and internet delivered psychotherapeutic intervention for young men's mental health.

Exercise therapy is becoming an effective mental health promotion strategy and a valuable first line treatment option for mental health difficulties including mild

symptoms of depression (Mental Health Foundation, 2005). Involvement in exercise intervention programmes has consistently been shown to be as effective as pharmacology and psychotherapy in treating symptoms of depression (Craft & Landers, 1998; Mead et al., 2009; North, McCullagh & Tran, 1990). In contrast to traditional treatments, which can carry stigma, exercise is socially acceptable and can be autonomous, addressing men's need for self-reliance. Furthermore, exercise programmes provide a potentially cost-effective alternative to conventional intervention strategies, free from adverse side-effects (Fox, Boutcher, Faulkner & Biddle, 2000; Mead et al., 2009). The beneficial effect of different types of exercise for symptoms of depression and other indices of mental health including anxiety, stress and self-esteem is supported by a substantial body of literature (Callaghan, 2004; DiLorenzo, et al., 1999; Dunn, Trivedi, Kampert, Clarke & Chambliss, 2005; Mead et al., 2009; Moses, Steptoe, Mathews & Edwards, 1989; North et al., 1990; Taylor, 2000). Hence, exercise therapy may be a more satisfactory self-help treatment option for those who are difficult to engage in formal mental health services (Chu, Buckworth, Kirby & Emery, 2009).

In addition to active participation in exercise proving helpful for mental health, community-based initiatives that utilise the context of exercise and sport to disseminate mental health promotion strategies have likewise proven successful (Pringle & Sayers, 2004). For example, the 'It's a Goal' and the 'Back of the Net (BTN)' programmes utilise the language and terminology of sport to address issues of mental health promotion purposely targeted at young men (McGale, McArdle & Gaffney, 2011; Pringle & Sayers, 2004). Specifically, these programmes are designed to address barriers to help-seeking specific to males, providing accessible avenues of support for this difficult to reach group. By employing sport as a metaphor for life these programmes have demonstrated efficacy in engaging men in mental health promotion

and improving mental health among men using a cognitive-behavioural therapeutic (CBT) and psychoeducational approach (McGale et al., 2011; Pringle & Sayers, 2004).

CBT and psychoeducation delivered via the internet is becoming increasingly popular as a first-line treatment for those experiencing psychological distress (Christensen, Griffiths & Jorm, 2004; Green & Iverson, 2009). Christensen (2010) describes online CBT interventions as interactive websites that teach psychotherapeutic techniques, provide information, and allow individuals to connect with health professionals or each other through the use of internet support groups (e.g., bulletin boards or discussion forums). Evidence-based CBT online interventions have been shown to be as effective as traditional face-to-face psychotherapeutic treatment methods and pharmacology in reducing symptoms of depression among community samples with increased depressive symptoms (Andersson, 2009; Griffiths, Farrer & Christensen, 2010). Findings from review studies further support the efficacy of internet delivered CBT both as an independent source of support and as an adjunct to usual care in the treatment of elevated depressive symptoms among community-based samples, with observed effect sizes ranging from 0.42 to 0.65 (Calear & Christensen, 2010; Griffiths & Christensen, 2006; Griffiths et al., 2010). This approach to delivering health promotion initiatives via the internet plays a significant role in removing barriers to help-seeking traditionally experienced by men (Calear & Christensen, 2010; Straten, Seekles, Veer-Tazelaar, Beekman & Cuijpers, 2010). For example, the internet is widely available and can be accessed anonymously. Self-help interventions offered through the internet are cost effective, free from stigma and address men's need for autonomy when seeking support for minor mental health problems (Burns, Davenport, Durkin, Luscombe & Hickie, 2010; Burns, Durkin & Nicholas, 2009; Burns, Webb, Durkin & Hickie, 2010; Christensen et al., 2004; McCrone et al., 2004; O'Kearney,

Gibson, Christensen & Griffiths, 2006; Powell & Clarke, 2006; Rickwood et al., 2007). As part of online CBT intervention strategies, the opportunity for online peer support provided by internet support groups (ISGs) presents an accessible and attractive alternative to face-to-face support groups (Griffiths & Reynolds, 2010; Houston, Cooper & Ford, 2002). The efficacy of ISGs for improving perceived social support and depression among users remains equivocal (Eysenbach, Powell, Englesakis, Rizo & Stern, 2004). Nonetheless, it has been recommended that ISGs providing psychoeducation, help-seeking encouragement and emotional support present an opportunity for positive mental health promotion among men (Lamberg, 2003; Powell, McCarthy & Eysenbach, 2003). Research in the area of computerised CBT for mental health is limited by predominance of female samples and methodological considerations such as failure to conduct intention-to-treat analysis (Griffiths & Christensen, 2006). Therefore, Griffiths and Christensen (2006) advise that there is a need for research investigating the usefulness of internet-based mental health interventions specific to young men. Recommendations for research also highlight the need to understand more about the expectations and experiences of those who make use of online programmes (Beattie, Shaw, Kaur & Kessler, 2009).

To date, few studies have investigated the effectiveness of combined exercise and psychotherapy interventions for mental health (Stathpoulou, Powers, Berry, Smits & Otto, 2006). Fremont and Craighead (1987) compared the separate and combined effects of exercise (running) and traditional cognitive therapy for symptoms of depression in a 10-week randomised trial. Findings from this study indicated that the combination of exercise and cognitive therapy did not enhance the treatment effects of either exercise or cognitive therapy alone. However, this study lacked a comparative control condition and the final sample size was small. Research in this area is limited

and additional studies are needed to investigate the potential of exercise and psychotherapy as combined treatments for depression (North et al., 1990).

According to the recommendations of the National Institute for Health and Clinical Excellence (NICE; 2009) people experiencing symptoms of depression should be offered psychosocial interventions including structured exercise programmes and computerised CBT. While limited research has explored the effectiveness of combined exercise and traditional psychotherapy programmes for improving mental health, no research has yet investigated the combination of exercise and computerised CBT for improving depressive symptoms. It is likely that, due to different mechanisms of action, the combined strategies of exercise and online CBT will be more effective for benefiting mental health than either strategy alone. In this study a CBT-based intervention specifically aimed at young men was delivered via the internet; '*LifeFit*' consisted of a CBT intervention utilising sporting metaphors to improve symptoms of depression and perceived social support among men via two main components. Skill building strategies were delivered via an online CBT programme and social interaction and support was provided by an electronic discussion forum. It was hypothesised that the combined treatment strategy (E+*LifeFit*) would prove to be more effective than exercise alone (E) or computerised CBT alone (*LifeFit*) for symptoms of depression and perceived social support in young men. It was further hypothesised that participants in these intervention conditions would demonstrate greater improvements in mental health compared to a control (C) condition.

## Method

### *Participants*

One hundred and thirty-six men aged 18-40 years were recruited for this study by means of advertisements placed locally. Specifically, adverts were placed in local newspapers over a collective period of approximately 4 weeks during which time leaflets were placed in neighbouring health centres and businesses and the study advertisement was distributed once via the university email system. The majority of participants were recruited in autumn 2009. Advertisements stated that we wanted to recruit young adult men to take part in a study investigating the effects of exercise and an online well-being programme on indices of physical and psychological well-being. Overall, there was an acceptable level of interest in this study; however, it was notable that the majority of enquiries were attracted to the exercise component. To be eligible to partake in this study participants were aged between 18 and 40 years, sedentary (i.e. currently exercising once per week or less) and not currently receiving any psychiatric treatment. Participants reporting any current use of antidepressants, drug or alcohol abuse problems or major physical health problems that would prevent participation in exercise for the duration of the study were not eligible to participate. Study eligibility was assessed via initial telephone screening.

### *Sample Size*

The primary end point used in the sample size estimate was treatment response as measured by the Beck Depression Inventory-2<sup>nd</sup> Edition (BDI-II; Beck, Steer & Brown, 1996). In terms of determining clinically important change when using the BDI-II, recommendations suggest that small differences can be sufficient when baseline depression is mild and larger differences are required when baseline depression is

severe (Hiroe et al., 2005; Seggar, Lambert & Hansen, 2002). Power analysis was calculated on the basis of data from our pilot study (McGale, McArdle & Gaffney, 2011) (e.g., BDI-II mean and standard deviation scores and between group differences on BDI-II scores post intervention) and pre-defined criteria for defining clinically significant decreases in depression based on BDI-II mean and standard deviation scores for community samples (Seggar et al., 2002). Given that participants in the pilot study reported minimal to mild mean BDI-II baseline scores, employing Seggar and colleagues' (2002) guidelines for community-based samples, a 4.5 point reduction in BDI-II scores was deemed a clinically significant treatment response. In addition, sample size estimate included the following assumptions (1) no adjustment for multiple comparisons, (2) a level of .05 for a two-tailed test, and (3) adjusting for an attrition rate of 30% (based on pilot study). Based on these assumptions, 115 participants (29 in each condition) were needed to achieve 80% or greater power to detect an effect size of .60 in treatment response between any of the two conditions.

### *Design & Protocol*

This research was approved by the institutional Human Subjects Review Board and is registered as clinical trial NCT00971217. Participants enrolled in this 10-week randomised control trial were randomly assigned to one of four study conditions by the main investigator. Participants were allocated to a combined exercise/internet-based CBT guided intervention (E+LifeFit,  $n = 32$ ), an exercise only condition (E,  $n = 38$ ), an internet delivered CBT guided intervention only condition (LifeFit,  $n = 33$ ) or a control condition (C,  $n = 33$ ).

Participants were contacted and informed of condition allocation. Written informed consent was obtained from all participants who were then asked to complete

baseline measures; all questionnaires were completed via a secure online website or in person. All participants completed the Beck Depression Inventory-2<sup>nd</sup> Edition (Beck, Steer & Brown, 1996) and the Social Provisions Scale (Cutrona & Russell, 1987) at baseline, week 5 and at post-intervention. Demographic information including a short alcohol consumption questionnaire was obtained from all participants at the baseline assessment. Those participants allocated to par-take in *LifeFit* (i.e., participants in the E+*LifeFit* and *LifeFit* conditions) were asked to complete a short qualitative questionnaire at post-intervention to aid study evaluation. Individuals allocated to the E+*LifeFit* and E conditions were also asked to complete a standard medical screening form which included items derived from the Physical Activity Readiness Questionnaire (PAR-Q; Thomas, Reading & Shephard, 1992) and assessed participants current level of physical activity. In addition these participants underwent a physical examination by a medical physician. No participant was found to have a medical condition that would put him at risk during exercise or exclude him from participation in the study. At this time, participants were also screened for severity of depressive symptoms. If any participant was found to be experiencing clinical levels of depression, he was evaluated by the physician and offered the opportunity to meet with a qualified clinical psychologist.

### *Intervention Protocol*

#### *Combined Exercise/Online CBT Intervention*

Participants allocated to the combined E+*LifeFit* study condition were asked to concurrently participate in both the exercise and the internet based CBT interventions detailed below.



### *Exercise Intervention*

Participants allocated to the exercise intervention study condition attended a familiarisation session in the university gym. During this time, participants were shown how to safely use the gym equipment and correctly wear a heart rate monitor. Each participant was briefed on exercising to different intensities and advised that they would exercise to moderate heart rate intensity at each gym session. Moderate exercise intensity was chosen following recommendations made by Dunn and colleagues (2005) and was calculated based on 70 to 80% of age predicted heart rate. A researcher informed each participant of their specific moderate heart rate range at the familiarisation visit. To familiarise themselves with the equipment and exercising within their moderate heart rate range, participants engaged in a short aerobic training session.

Participants were asked to attend a maximum of 20 supervised exercise sessions at the university gym over the 10 week intervention period; no instruction was given as to whether individuals should increase their level of physical activity outside of the assigned gym sessions. Each exercise session lasted 55 minutes during which time participants engaged in independent aerobic and resistance training. Each session consisted of a 10 minute warm-up, 40 minutes of intermittent exercise and a 5 minute warm-down. Participants were asked to wear a heart rate monitor at each session and to self-check that they were exercising within their moderate range. Participants were asked to exercise within their moderate heart rate range for no less than 35 minutes at each session.

### *Online CBT Intervention ('LifeFit')*

Participants allocated to par-take in the 10-week internet based CBT *LifeFit* programme attended a familiarisation session where they were introduced to each other.

To ensure that all participants were knowledgeable in using a computer and accessing the internet, the researcher demonstrated on a computer how to login and navigate the study website. Detailed written instructions outlining login procedures and terms of use of the study website and its contents were also given to each participant. Any participant who did not have regular access to a computer was advised of local resources where they could access the internet for free. To ensure confidentiality, access to the study website was password protected. Therefore, participants were asked to login via a self-registration process which allocated a unique login username and password to each individual. Immediately following registration, participants completed session one of the programme. Subsequent sessions were made available on the study website on a weekly basis, at which time a reminder email was sent to participants prompting them to complete the session. It was expected that time spent on each weekly session was approximately 10 to 15 minutes.

The *LifeFit* intervention consisted of a 10-week interactive, multimedia, CBT-based programme delivered via the internet. Core strategies of CBT such as psychoeducation, guided discovery and skill building were incorporated into the online programme to address a number of mental health themes over the course of the intervention. The themes included mental preparation, relaxation, supportive relationships, problem solving, conflict management, resilience, positive thinking styles, mindfulness and maintaining a healthy lifestyle. These themes were addressed via two main components of the programme, namely, the central online programme and the electronic discussion forum.

The central online programme involved a number of exercises including quizzes, personal tasks and videos of real life scenarios and events. To aid guided discovery, psychoeducation and skill building revolved around the use of sports metaphors. Sports

metaphors drew on historic sporting events as well as recent topical happenings in football, rugby, boxing and golf. Quotes from popular sports people and well-known sporting films were used to illustrate and reiterate key points throughout the sessions. In an effort to engage young men sessions were largely interactive. For example, participants were asked to complete a quiz following a short sports-based video or a sports news article which was relevant to the weekly theme. Each quiz was designed to facilitate guided discovery and reinforce the key points from the video/news article and feedback was automatically provided to participants upon completion. In learning about resilience, for example, participants watched a real life video clip on the subject of the national rugby team who had prominently risen to great success following a previously disappointing and defeatist championship campaign. The quiz related to this clip was designed so that participants would take into consideration each of the skills required for resilience and why being resilient is important for positive mental health. Participants were also encouraged to complete ‘personal tasks’ each week as a homework activity, which required participants to reflect on the weekly theme in some way and to apply the skills learned in session to their home-lives. For example, building on the theme of resilience, participants were encouraged to think about how their favourite sports stars overcome defeats and what lessons could be learned from their experiences. The key points from each theme were reiterated in quizzes and personal tasks across the entire CBT programme.

The second component to the *LifeFit* intervention was an electronic discussion forum which was designed to stimulate discussion surrounding mental health and provide peer support to participants. Again, sports metaphors were used to spark group discussion. Participants were encouraged to post regularly on the discussion board in an effort to engage with other users of the study website and to generate discussion of

mental health issues. Email notification of each post was sent to the main researcher who acted as site moderator.

### *Control*

Participants allocated to the control condition were asked to refrain from participating in a structured exercise programme during the 10 week study period and subsequently offered use of the gym facilities upon completion of the study.

### *Measures*

#### *Beck Depression Inventory-2<sup>nd</sup> Edition (BDI-II)*

The BDI-II (Beck, Steer & Brown, 1996) is a 21-item self-report instrument that identifies the presence and severity of somatic and affective symptoms consistent with depression. Each item assesses symptom severity on a 4-point scale ranging from 0 to 3. A total BDI-II score of 13 or less is within the minimal range of symptom severity, a total score ranging between 14 and 28 is considered mild/moderate and between 29 and 63 is considered indicative of severe depression. The BDI-II has been validated with both psychiatric and normative populations and has been shown to have good reliability (Beck, Epstein, Brown & Steer, 1988). Cronbach alpha coefficient for the BDI-II in the present study was .85.

#### *Social Provisions Scale (SPS)*

The SPS (Cutrona & Russell, 1987) is a 24-item scale that assesses the degree to which individuals perceive their social relationships to be supportive. Each item is rated on a 4-point scale ranging from 1 to 4 and assesses the presence and absence of six facets of social relations; attachment, social integration, reassurance of worth, reliable alliance, guidance and opportunity for nurturance. Total SPS scores range from 24 to 96 with higher scores indicating a greater degree of perceived support. The SPS has

demonstrated good reliability and validity with a number of populations including psychiatric, low income and all male samples. (Caron, Tempier, Mercier & Leouffre, 1998; Cutrona & Russell, 1987; Wester, Christianson, Vogel & Wei, 2007). Cronbach alpha coefficient for the SPS in the present study was .89.

#### *Alcohol consumption*

A short questionnaire was devised by the researchers to indicate the units of alcohol consumed by participants. Average weekly alcohol consumption was calculated for each participant based on the number of days in a week they typically consumed alcohol and the number of units they would typically consume on average in one day. As a guide, participants were told that 1 unit of alcohol is equivalent to half a pint of beer, a pub measure of fortified wine or a small glass of wine; 1½ units is equivalent to a pub measure of spirits and 2 units is equivalent to a pint of beer or a large glass of wine.

#### *Post-Intervention Evaluation Questionnaire*

Participants in the E+LifeFit and LifeFit conditions were asked to indicate which LifeFit sessions they had completed at week 5 and post-intervention data collection. In addition, the number of completed LifeFit sessions was checked by the researcher based on site activity for each participant. At post-intervention participants who completed the online programme also completed a short qualitative questionnaire which was designed to aid evaluation of overall study participation and specifically enjoyment and experiences of the online CBT programme. Participants were asked “What did you enjoy most about taking part in the study?”, “Do you think that young men could easily relate to the content of the online programme?” and “Do you think that the online programme taught you useful skills that you can use in everyday life?” Additionally,

participants who had completed the internet based CBT intervention were asked to rate the online activities in order of preference based on enjoyment.

### *Heart Rate*

Participants allocated to the E+*LifeFit* and E conditions were provided with Polar RS400 individual heart rate monitors which they wore at each exercise session throughout the intervention period. Each heart rate monitor consisted of a transmitter belt and the RS400 watch which allowed participants to monitor their own heart rate. Heart rate data was analysed using the Polar ProTrainer 5 software.

### *Data Analysis*

To calculate group differences in demographic and outcome variables at baseline One-way Analysis of Variance (ANOVA) were used for continuous variables and Fisher Exact Tests were employed for categorical variables. Internal reliability and correlation analyses were also run on the primary outcome variables. To detect group differences across time on depression and perceived social support mixed effects regression analysis was employed. A linear mixed effects model includes all available data for each participant and has been recommended as an intent-to-treat analysis in longitudinal studies with missing values (Chakraborty & Gu, 2009). In all models the intervention condition, the time effect and condition by time interaction were fixed effects and the participant was included as a random effect. When significant main or interaction effects were detected, post hoc planned comparisons were ran. Statistical output for this mixed effects regression analysis presents the mean response for each factor which is *adjusted* for any other variables in the model. In this study, a complete model was fit to test for significant main and interaction effects and as such any adjusted means reported are the same as observed means. SPSS version 17.0 was used

for all statistical analyses and an alpha level of 0.05 was set. The effect size of intervention condition on the primary outcome variables was calculated using Hedges' *g*.

Of the 136 men enrolled in the study and randomised to study condition, 133 (98%) were included in the final analysis; two participants did not attend the initial familiarisation visit or complete any of the study questionnaires and one participant was eliminated as an outlier following initial diagnostic statistical analysis. Post-intervention measures were completed by 91 participants; 67% of the original sample enrolled in the study (see Figure 4.1).

## Results

### *Descriptive Statistics*

There was a small significant negative correlation between depression and perceived social support at baseline ( $r = -.30, n = 132, p < .01$ ). At baseline assessment the sample had a mean (SD) age of 26.93 (6.23) years; 73% were single; 98% were Caucasian and 2% described themselves as mixed ethnicity; 81% of the sample was in full-time employment; 41% reported having a graduate level education and 98% of the overall sample had previously used a PC. With respect to exercise behaviour, 51% of participants reported no involvement in exercise whatsoever and 49% were exercising no more than once per week; 21% of participants included in the analysis reported mild/moderate to severe depression as measured by the BDI-II. With the exception of reported smoking behaviour, no statistically significant differences were detected between the four groups on demographic or primary variables at baseline (Table 4.1).

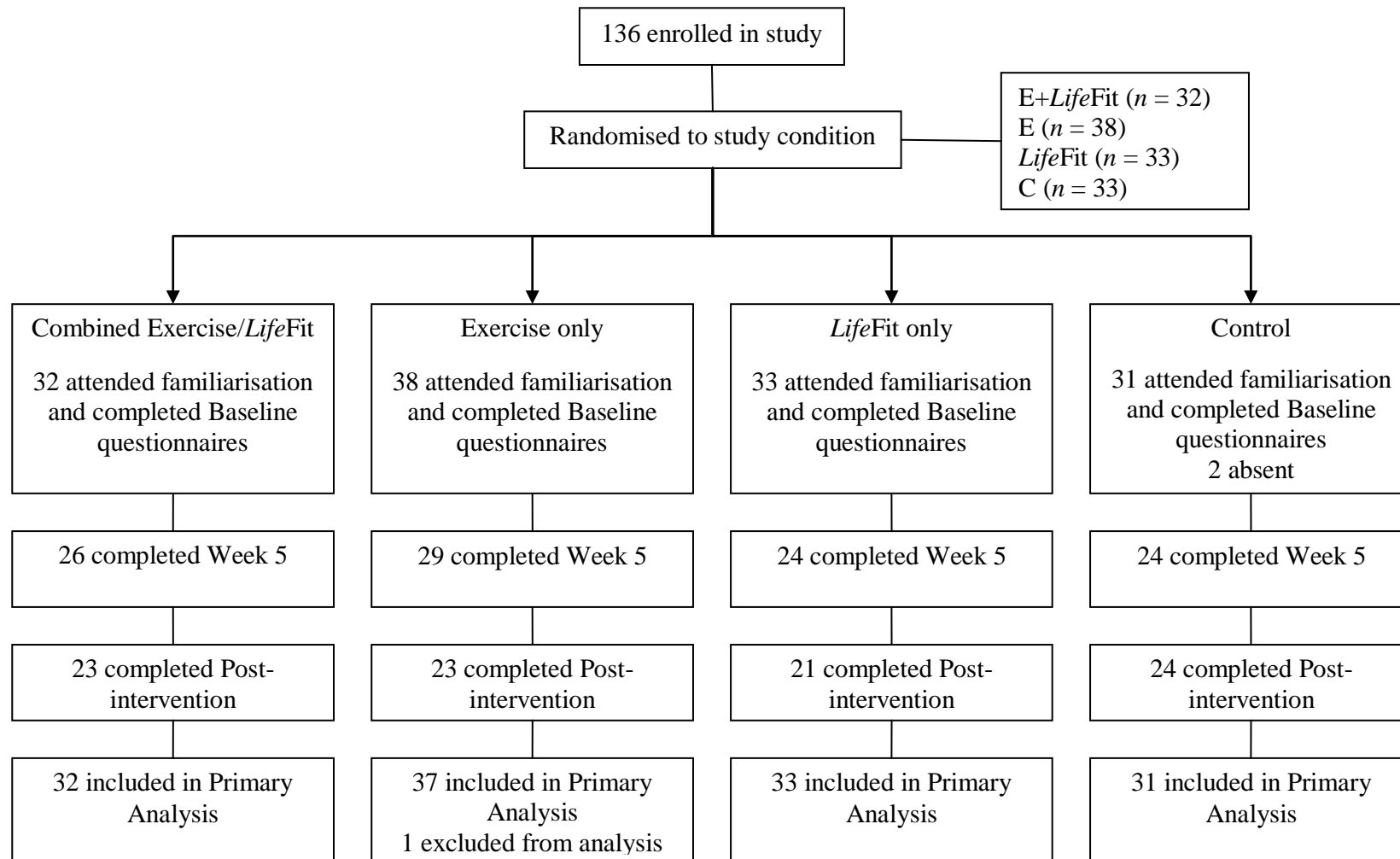


Figure 4.1. Flow of Study Participants



Table 4.1.  
Baseline characteristics by study condition

Variable	E+ <i>LifeFit</i> n = 32	Exercise n = 37	<i>LifeFit</i> n = 33	Control n = 31	Total n = 133	<i>P</i> Value
Age, mean years (SD)	25.78 (6.12)	28.73 (6.11)	25.27 (6.35)	27.74 (5.94)	26.93 (6.23)	.07 <sub>a</sub>
Range, years	18 – 40	18 – 38	18 – 35	18 – 39	18 – 40	
Ethnicity						.80 <sub>b</sub>
Caucasian, n (%)	31 (97)	36 (97)	33 (100)	30 (97)	130 (98)	
Asian, n (%)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
African, n (%)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
Other ethnicity, n (%)	1 (3)	1 (3)	0 (0)	1 (3)	3 (2)	
Marital Status						.39 <sub>b</sub>
Single, n (%)	26 (81)	27 (73)	27 (82)	17 (55)	97 (73)	
Married, n (%)	4 (13)	7 (19)	5 (15)	7 (23)	23 (17)	
Cohabiting, n (%)	2 (6)	2 (5)	1 (3)	4 (13)	9 (6)	
Separated, n (%)	0 (0)	1 (3)	0 (0)	1 (3)	2 (2)	
Divorced, n (%)	0 (0)	0 (0)	0 (0)	2 (6)	2 (2)	

Employed, n (%)	18 (56)	26 (70)	16 (49)	21 (68)	81 (61)	.23 <sub>b</sub>
Education Level						.18 <sub>b</sub>
No formal Education, n (%)	0 (0)	1 (3)	0 (0)	0 (0)	1 (1)	
Secondary, n (%)	2 (6)	13 (35)	7 (21)	6 (19)	28 (21)	
Graduate, n (%)	15 (47)	11 (30)	16 (49)	13 (42)	55 (41)	
Postgraduate, n (%)	15 (47)	12 (32)	10 (30)	12 (39)	49 (37)	
Previous use of PC, n (%)	32 (100)	35 (95)	33 (100)	31 (100)	131 (98)	.25 <sub>b</sub>
Exercise Behaviour						.77 <sub>b</sub>
Not exercising, n (%)	15 (47)	19 (51)	19 (58)	14 (45)	67 (51)	
Exercising once per week, n(%)	17 (53)	18 (49)	14 (42)	17 (55)	66 (49)	
Currently Smoking, n (%)	3 (9)	17 (46)	12 (36)	14 (45)	46 (35)	<.01 <sub>b</sub>
Consume Alcohol, n (%)	27 (84)	31 (84)	28 (85)	30 (97)	116 (87)	.29 <sub>b</sub>
Weekly Units of Alcohol, m (SD)	17.22 (15.47)	19.65 (19.69)	15.82 (15.34)	18.58 (14.45)	17.86 (16.39)	.79 <sub>a</sub>
BDI-II, mean (SD) <sub>c</sub>	9.09 (6.60)	8.78 (6.60)	9.24 (6.60)	7.68 (6.60)	8.70 (6.62)	.78 <sub>a</sub>
SPS, mean (SD) <sub>c</sub>	80.97 (9.31)	80.62 (9.31)	80.41 (9.31)	83.52 (9.30)	81.38 (17.15)	.53 <sub>a</sub>

Abbreviations: BDI-II, Beck Depression Inventory-2<sup>nd</sup> Edition; SPS, Social Provisions Scale; n, number.

<sub>a</sub> One-way ANOVA; <sub>b</sub> Fisher Exact Test; <sub>c</sub> Adjusted mean (SD) score.

Number of exercise sessions attended at week 5 did not statistically differ between the E ( $M = 9.54$ ,  $SD = 2.03$ ) and the combined E+LifeFit ( $M = 9.73$ ,  $SD = 1.17$ ) condition,  $t(52) = -0.38$ ,  $p > .05$ . Similarly, there was no significant difference for number of exercise sessions attended at post-intervention between the E ( $M = 15.76$ ,  $SD = 2.55$ ) and the E+LifeFit ( $M = 16.74$ ,  $SD = 2.88$ ) condition,  $t(46) = -1.25$ ,  $p > .05$ . There was also no significant difference in exercise heart rate (beats per minute, bpm) between the E ( $M = 141.9$ ,  $SD = 10.1$ ) and the combined E+LifeFit ( $M = 142.2$ ,  $SD = 8.6$ ) condition,  $t(66) = -0.13$ ,  $p > .05$ ; individual heart rate analysis indicated that participants exercised within their moderate heart rate range for no less than 35 minutes at each exercise session.

### *Intervention Outcomes*

#### *BDI-II*

For BDI-II depression scores there was a significant effect for time  $F(2, 98) = 18.29$ ,  $p < .01$ , and condition by time interaction  $F(6, 98) = 5.59$ ,  $p < .01$ . Planned comparisons were examined to test for a linear trend in BDI-II scores over time for each condition and to examine significant condition by time interactions. Time significant changes were observed for the combined E+LifeFit condition  $t(102) = 3.61$ ,  $p < .01$ ; the Exercise group  $t(104) = 5.19$ ,  $p < .01$ ; and the LifeFit  $t(105) = 2.72$ ,  $p < .01$  condition between baseline and week 5. Time significant changes were again observed for the three intervention conditions; combined E+LifeFit  $t(100) = 5.24$ ,  $p < .01$ ; Exercise  $t(101) = 5.64$ ,  $p < .01$ ; and LifeFit  $t(103) = 2.59$ ,  $p < .05$  between baseline and post-intervention. There was also a significant change in depression scores for the E+LifeFit condition between week 5 and post-intervention  $t(90) = 2.71$ ,  $p < .01$ . No other statistically significant changes across time points were observed.

Planned comparisons revealed significant condition differences in BDI-II scores between the exercise only and control conditions at week 5  $t(113) = -2.67, p < .01$ , effect size  $-0.72$  and again at post-intervention  $t(108) = -3.21, p < .01$ , effect size  $-0.92$ . Significant condition differences in BDI-II scores were also observed between the combined E+LifeFit condition and the control condition at post-intervention  $t(107) = -2.84, p < .01$ , effect size  $-0.82$ . No other significant differences were found between conditions over the three time points. The adjusted mean total scores for each of the study conditions on the BDI-II over time are presented in Table 4.2 and depicted graphically in Figure 4.2.

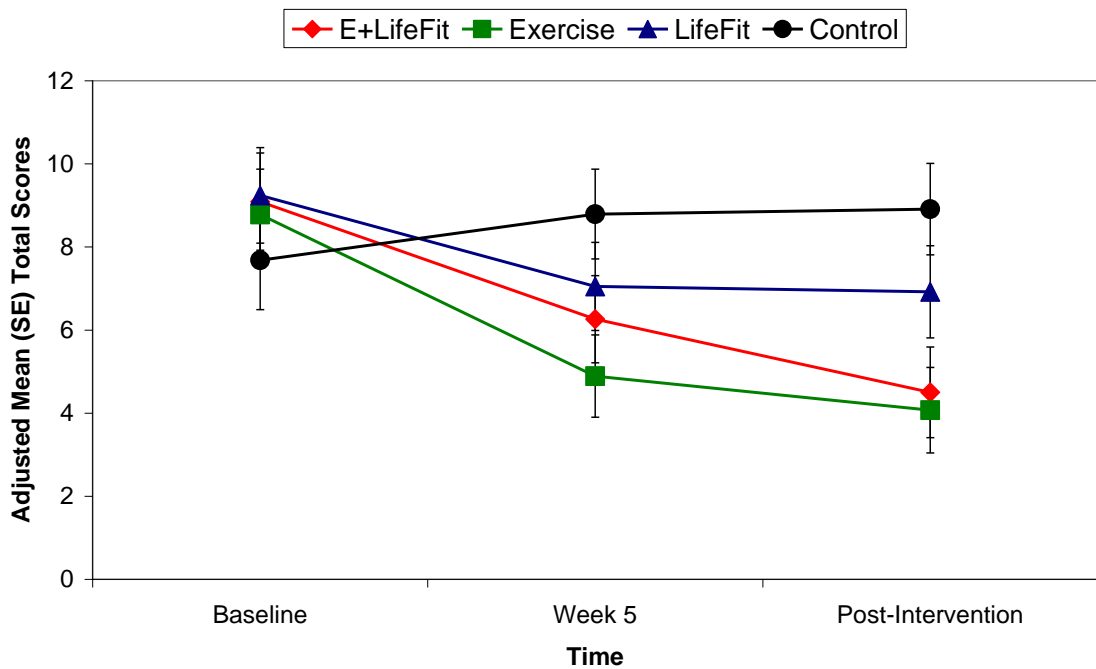


Figure 4.2. Adjusted mean scores for BDI-II across time

## SPS

For SPS perceived social support scores there was a significant effect for time  $F(2, 96) = 5.29, p < .01$ , and a non-significant condition by time interaction effect  $F(6, 96) = 1.84, p > .05$ . Planned comparisons across the three time points were examined for each condition. Time significant changes were observed for the combined E+LifeFit condition between baseline and post-intervention  $t(98) = -3.30, p < .01$ , and again between week 5 and post-intervention  $t(91) = -3.69, p < .01$ . No other statistically significant changes across time points were observed. The adjusted mean total scores for each of the study conditions on the SPS over time are presented in Table 4.2 and depicted graphically in Figure 4.3.

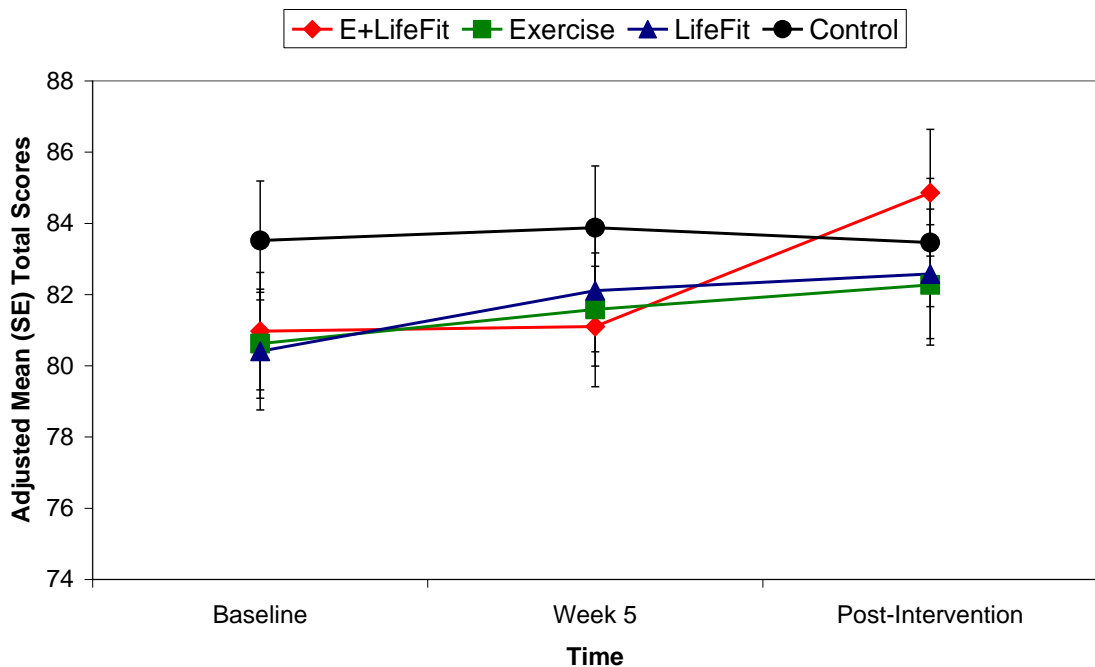


Figure 4.3. Adjusted mean scores for SPS across time

Table 4.2.

Adjusted Mean Scores, Standard Deviations and Range across Time

		Adjusted Mean (SD)		
		Range		
		Baseline	Week 5	Post-Intervention
<i>E+LifeFit</i>	BDI-II	9.09 (6.60) 1 – 23	6.26 (5.34) 0 – 18	4.50 (5.23) 0 – 15
	SPS	80.97 (9.31) 61 – 92	81.10 (8.64) 62 – 92	84.86 (8.57) 60 – 96
Exercise	BDI-II	8.78 (6.60) 0 – 27	4.89 (5.23) 0 – 17	4.07 (4.84) 0 – 11
	SPS	80.62 (9.31) 60 – 96	81.58 (8.43) 64 – 96	82.28 (7.90) 58 – 96
<i>LifeFit</i>	BDI-II	9.24 (6.60) 0 – 26	7.05 (5.18) 0 – 22	6.92 (5.07) 0 – 20
	SPS	80.41 (9.31) 53 – 96	82.11 (8.40) 59 – 96	82.58 (8.34) 58 – 96
Control	BDI-II	7.68 (6.60) 0 – 30	8.79 (5.27) 0 – 22	8.91 (5.39) 0 – 25
	SPS	83.52 (9.30) 62 – 96	83.83 (8.49) 65 – 96	83.46 (8.83) 62 – 96

### *Rates of Change*

The percentage change in mean BDI-II scores from baseline to post-intervention for the combined E+*LifeFit* and the E condition was 51% and 54% decrease respectively. The mean BDI-II score for the *LifeFit* condition decreased by 17% over the 10-week intervention period and increased by 16% for the control group. Higher scorers were identified as those who reported total scores of 14 or more on the BDI-II at baseline ( $n = 28$ ). Mean BDI-II for high scorers in the E+*LifeFit* condition decreased by 59% from baseline to post-intervention, by 75% for those in the E condition, and by 40% for high scorers in the *LifeFit* condition. Within the control condition mean BDI-II decreased by 2% for high scoring participants from baseline to post-intervention. When change in BDI-II scores for each group were compared to pre-defined guidelines for assessing a clinically significant decrease in depression (Seggar et al., 2002) only the post-intervention mean scores for those in the combined E+*LifeFit* and the E conditions met criteria for a clinically significant reduction.

Mean SPS scores from baseline to post-intervention increased by 5% and 2% for the E+*LifeFit* and the E conditions respectively. The mean score for the *LifeFit* condition increased by 3% and no change in mean SPS was calculated for the control group across time.

### *CBT-online Programme Fidelity*

Self-reported adherence to the online *LifeFit* sessions was confirmed by analysis of website activity. 100% of participants in the combined E+*LifeFit* condition completed at least 6 out of the 10 online CBT sessions compared to 76% of those in the *LifeFit* only condition. At week 5 there was a significant difference on number of online sessions completed between the combined E+*LifeFit* ( $M = 3.46$ ,  $SD = 0.65$ ) and

the *LifeFit* ( $M = 4.43$ ,  $SD = 0.79$ ) condition,  $t(47) = -4.75$ ,  $p < .01$ . A significant difference was again observed at post-intervention between the *E+LifeFit* ( $M = 9.30$ ,  $SD = 1.06$ ) and the *LifeFit* only ( $M = 7.14$ ,  $SD = 1.91$ ) condition,  $t(31) = 4.59$ ,  $p < .01$ .

#### *Post-intervention Qualitative Evaluation of CBT-online Programme*

In analysing participant's enjoyment and experiences of the online intervention qualitative responses were coded to reflect broad themes which differed by intervention condition. For the combined *E+LifeFit* condition a prominent theme that emerged was 'improved fitness'; 75% ( $n = 15$ ) of those who responded at post-intervention reported positive experiences of enhanced physical fitness and health as what they most enjoyed about the study. The themes 'social interaction' (15%,  $n = 3$ ) and 'self-reflection on thoughts/behaviour' (10%,  $n = 2$ ) also emerged within the combined *E+LifeFit* condition. For the *LifeFit* only condition the themes that emerged include 'stress management' (24%,  $n = 4$ ), 'sense of achievement' (29%,  $n = 5$ ), 'self-reflection on thoughts/behaviour' (18%,  $n = 3$ ), and 29% ( $n = 5$ ) of participants considered the 'CBT-online tasks' to be the most enjoyable aspect of taking part in the study.

Participants that completed the online intervention rated the sports based video clips as the most enjoyable component of the intervention, followed by the quizzes and the weekly personal tasks. The discussion forum was the least enjoyable aspect of the online programme.

All respondents in the *E+LifeFit* ( $n = 23$ ) and the *LifeFit* ( $n = 21$ ) conditions agreed that young men could easily relate to the content of the online programme. The issues raised throughout the programme were viewed as "interesting," "topical," and "relating to real life concerns...presented in an easily accessible frame of reference (sport)." Participants also felt that the online format of the programme was a "good use



of technology” and that discussion forums and online video clips were “current” and a “heavy source of influence on young men these days, allowing interaction and awareness of others opinions.”

For participants in the combined E+*LifeFit* programme 83% ( $n = 19$ ) felt that the online programme taught them useful skills that they could use in everyday life, this is comparable to 85% ( $n = 17$ ) of those in the *LifeFit* only condition. Participants indicated that the online CBT programme helped them to develop skills such as coping with stress, mindfulness, self-care behaviour and communication skills. 17% ( $n = 4$ ) of those in the E+*LifeFit* condition and 15% ( $n = 3$ ) of those in the *LifeFit* group disagreed that the programme taught them useful skills. For the most part these participants felt that they “knew most of the skills already” and one participant revealed a preference for “dealing with life issues by myself.”

## Discussion

The results of the present study indicated that combining exercise with a CBT-based intervention delivered via the internet conferred no additional advantage to exercise therapy alone. This suggests that the processes through which exercise operates exert a larger effect on symptoms of depression, compared to the mechanisms of action underlying the therapeutic benefit of the *LifeFit* online CBT programme utilised in this study. The results of this study found that, compared to a computerised CBT intervention, exercise proffers the optimum low-intensity self-help treatment strategy for those experiencing minor levels of distress. As such, it is recommended that exercise shows promise as the treatment of choice for health professionals in terms of minimal first-line treatments for depression. Future comparative studies should continue to examine the relative effectiveness of exercise and other low-intensity psychosocial interventions (e.g., group psychotherapy, self-help manuals based on CBT principles, internet-based CBT) for improving the mental health of young males and other populations.

Findings from this RCT indicated that all three interventions conditions exerted a significant beneficial effect on symptoms of depression over time. However, only participants involved in both exercise study conditions (i.e., E only and combined E+*LifeFit*) experienced a clinically significant reduction in depressive symptoms. This is consistent with previous evidence that exercise has a causal beneficial effect on symptoms of depression (Mead et al., 2009). This finding is particularly pertinent given that exercise therapy may help address barriers to psychological help-seeking, such as feelings of stigma, traditionally experienced by young men (Mental Health Foundation, 2005). It is argued that exercise therapy should continue to be pursued as a valuable self-help treatment option for young adult males experiencing distress.

For those who are reluctant to engage in exercise therapy, the type of online CBT programme employed in this study, may present an attractive alternative self-help treatment option. Given that some therapeutic effect was detected with depression scores for the *LifeFit* only condition decreasing by 17% from baseline to post-intervention, it is suggested that *LifeFit* shows promise as a mental health promotion strategy specific to young men. However, additional research into its effectiveness is needed. For example, there is still much we do not know in relation to the role of the therapist in internet based mental health interventions (Andersson, 2009; Klein et al., 2009). Therapist support in this study was minimal, with participants in the *LifeFit* programme receiving just one weekly reminder email and no one-on-one therapist support or advice. Due to their involvement in the exercise sessions, participants in the combined E+*LifeFit* condition had additional contact with the researcher which potentially acted as a further reminder to complete the online programme, and which may explain why participants in this condition completed significantly more online sessions compared to participants in the *LifeFit* condition at post-intervention. In terms of future research, it would be interesting to investigate whether a more active therapist role in the online programme would have a more positive effect on both adherence and outcome in this study. Despite participants in E+*LifeFit* completing more online CBT sessions it is likely that this additional engagement did not lead to a significant reduction in depression given the brevity of the online programme used in this study. In addition, it is perhaps not surprising that the findings of the present study are not comparable to other online CBT interventions for depression which are more extensive in terms of time spent on the programme (e.g., the MoodGYM intervention; Christensen et al., 2004; Griffiths, Christensen, Jorm, Evans & Groves, 2004). Future research investigating the *LifeFit* programme should examine the relative effects of expanding

the online intervention to increase time spent on the CBT-based programme. Further, it has been suggested that examining the role of the internet as a tool for engaging people with minor mental health difficulties is particularly important for those where stigma inhibits help-seeking through more traditional routes (Beattie et al., 2009; Berger, Wagner & Baker 2005). In view of this, the qualitative findings from this study provide an impetus for future research to investigate the usefulness and acceptability of tailored online CBT interventions among young adult males. Of value is the finding that participants could easily relate to the sports-based nature of the *LifeFit* programme; future research should continue to explore the role that sport can play in mental health promotion.

Changes in perceived social support did not differ by study condition at either week 5 or post-intervention. It is therefore unlikely that the addition of the electronic discussion forum within the online intervention served to significantly improve feelings of social support among participants. In fact, the discussion forum was rated the least favourable online activity. Perceived social support did, however, statistically improve across the course of the study for those individuals in the combined exercise and online CBT condition. It was apparent that a number of individuals in this group routinely attended the same gym sessions and that their involvement in the online intervention was used to initiate discussion with each other. It may be the case that relationships made online need to develop in real life before they have an impact on one's social support network.

The absence of follow-up data collection presents a limitation for this study. It is unclear whether those who participated in the exercise intervention conditions continued to regularly exercise beyond completion of the study. Such data would provide an insight into long-term adherence to exercise programmes in men who were

previously sedentary. Due to lack of follow-up data, questions also remain as to whether the therapeutic effect of exercise persisted beyond participation in the study exercise programme. Future research needs to be conducted with long-term follow-up of depression scores and exercise behaviour to determine if mental health benefits are maintained after the completion of a structured exercise programme. The participant sample employed in this study presents a further limitation in terms of generalizability of study findings. Participants were predominantly white, single, employed and of a university-level educational background. It would be interesting to investigate the effects of both the exercise programme and the *LifeFit* intervention among men of differing demographic characteristics. In addition, a further limitation was the use of self-reported exercise behaviour to assess sedentariness. An objective measure of participant's level of physical activity would have provided a more stringent and consistent method for screening participants, and allow for a comprehensive understanding of participant's level of engagement in exercise at baseline.

This is the first known study to investigate the effectiveness of a combined exercise and internet delivered CBT intervention for men's mental health. Research should continue to explore the effectiveness of combined interventions for improving mental health and, at the same time, it would be worthwhile to examine the psychological mechanisms underpinning the observed treatment effects. A better understanding of the potential processes of change is fundamental to understanding the ways in which various therapeutic interventions benefit mental health and for planning future intervention programmes.

While the attrition rate in this study is comparable to other exercise-based intervention studies (e.g., Chu et al., 2009; Dunn et al., 2005), there is a need to investigate strategies for improving adherence to exercise programmes. To this end,

future research should focus on investigating the attitudes of young men in relation to exercise interventions for mental health. Qualitative research conducted with community samples of young men will help advance our understanding of how best to develop and deliver exercise interventions for those who are reluctant to seek formal help for mental health difficulties.

In sum, the findings from this study showed that the combination of exercise and an internet delivered CBT intervention did not produce additional benefit to reducing symptoms of depression among a community sample of young men beyond the effects of exercise alone. Given the significant effect of aerobic and resistance training on symptoms of depression in the current study, and the autonomous nature of exercise, it is argued that exercise presents an effective early intervention strategy for improving the mental health of young men.

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## **CHAPTER 5**

# **EXPLORING POTENTIAL PSYCHOLOGICAL MECHANISMS OF CHANGE UNDERPINNING THE ANTIDEPRESSANT EFFECT OF EXERCISE**



## Abstract

**Objective:** To investigate whether change in exercise self-efficacy, physical self-concept and global self-esteem would mediate change in depression among exercisers compared to a control condition. A related aim was to examine the temporal relation of change among potential mediators and depression.

**Design:** 10-week randomized control trial.

**Methods:** A total of sixty-nine randomly assigned sedentary men completed either an exercise intervention or a control condition. The exercise intervention consisted of moderate intensity aerobic and resistance training while the control group refrained from exercise. Participants completed the Beck Depression Inventory-2<sup>nd</sup> Edition (BDI-II) and a number of subscales from the Physical Self-Description Questionnaire (PSDQ). Measures were taken at baseline, week 5 and post-intervention.

**Results:** Change in exercise self-efficacy, physical self-concept and global self-esteem failed to fulfil traditional requirements for mediation. An investigation of the temporal pattern of change found statistically significant improvements in depression and all of the potential mediators between baseline and week 5 for participants in the exercise intervention condition.

**Conclusion:** Based on the temporal pattern of change among the variables investigated, it is likely that change in self-efficacy, physical self-concept and global self-esteem are important factors in the relationship between exercise and depression. However, further research is needed to determine the causal relationship between the putative mechanisms and depression. Overall, findings from this study demonstrate that exercise is associated with rapidly occurring psychological benefits.

The antidepressant effect of exercise is well documented and a number of biochemical, physiological and psychosocial factors have been proposed as mediators of this relationship (Biddle, Fox & Boucher, 2000; Cerin, 2010; Fox, 1999; Mead et al., 2009; Remington, 2009). In its simplest form, a mediator is an intervening variable that transmits the effects of an independent variable on a dependent variable (MacKinnon, Fairchild & Fritz, 2007). Mediation analysis therefore allows us to uncover the psychological processes, or mechanisms, underpinning therapeutic change (Kazdin & Nock, 2003; MacKinnon et al., 2007). Currently, support is emerging for the role of biological mechanisms in explaining the beneficial effects of exercise (Dishman & O'Connor, 2009; Remington, 2009). However, empirical research into putative psychological mechanisms of change is limited, and as a result, the processes responsible for the salutary effect of exercise on depression remain fundamentally unknown (Cerin, 2010; Craft, 2005; Foley et al., 2008; Fox, 2000; Stathopoulou, Powers, Berry, Smiths & Otto, 2006). Identifying mechanisms of therapeutic change is fundamental to developing a theoretical understanding of how and why an exercise intervention works and allows us to design interventions that maximise treatment effects and promote adherence (Kazdin & Nock, 2003; Taylor & Faulkner, 2008). Of particular importance is the demonstration of a temporal relationship of change among potential mediator variables with an outcome variable, as this permits the inference of causality, providing the strongest case for mediation in randomised trials (Hill, 1965; Kazdin, 2007; Kazdin & Nock, 2003; Stice, Presnell, Gau & Shaw, 2007). To date, exploratory research has implicated self-esteem (Ryan, 2010; Sonstroem, Harlow & Joesphs, 1994; Van de Vliet et al., 2002), physical self-concept (Dishman et al., 2006; Ryan, 2010; White, Kendrick & Yardley, 2009) and self-efficacy (Bodin & Martinsen, 2004; Chu, Buckworth, Kirby & Emery, 2009; Craft, 2005; Foley et al., 2008) as

plausible mediators of the antidepressant effect of exercise. However, research in this area is tentative; thus far, only one study has attempted to investigate the temporal relationship of change among mediating and outcome variables (e.g., White et al., 2009) and no research has yet employed a controlled longitudinal design. The aim of this study was to examine a number of possible mechanisms of exercise influence on depression in young men engaged in an aerobic exercise intervention. Specifically, employing a randomised controlled design, this study examined whether change in global self-esteem, physical self-concept and self-efficacy would mediate the effect of exercise on change in depressive symptoms. A related aim was to explore the temporal patterns of change in potential mediators and depression.

Engaging in exercise is consistently associated with improved feelings of global self-esteem and physical self-perception (Fox, 1999, 2000; Marsh, 1996; Schneider, Dunton & Cooper, 2009; Scully, Kremer, Meade, Graham & Dudgeon, 1998) and both of these factors are inversely related to experiences of depressed mood (Fox, 2000; Ossip-Klein et al., 1989). Cross-sectionally, the Exercise and Self-Esteem Model (EXSEM, Sonstroem et al., 1994) provides evidence that these variables might mediate improvements in depression. Rooted in Shavelson, Hubner and Stanton's (1976) contemporary theory of self-concept, the EXSEM characterises self-esteem as a multidimensional and hierarchically organised construct. Global self-esteem represents perceptions of self-worth in academic, social, emotional and physical domains and in turn each of these four domains comprises more specific sub-domains (Shavelson et al., 1976). For example, physical self-concept is characterised by an individual's perception of their appearance, strength, body fat, coordination and other related aspects of the physical self (Hagger, Biddle & Wand, 2005; Marsh, Richards, Johnson, Roche & Tremayne, 1994). The EXSEM provides a framework which allows us to

conceptualise how changes in physical self-concept are mediated by global self-esteem change to account for improvements in depression within an exercise intervention (McAuley, Mihalko & Bane, 1997; Van de Vliet et al., 2002). It assumes that exercise produces positive changes in perceptions of self-efficacy which generalise to changes in physical self-perception sub-domains leading to improved feelings of overall physical self-worth. Changes in physical self-worth may, in turn, have implications for change in global self-esteem and diminished feelings of depression.

In contrast to the EXSEM, current research suggests that self-efficacy, physical self-concept and global self-esteem may in fact have independent effects on depressive symptoms in those engaged in exercise (Ryan, 2008, 2010). According to Bandura (1997, 1999) psychotherapeutic treatments facilitate behaviour change by strengthening perceived self-efficacy, that is, the belief that one has the ability to perform particular behaviours to produce desired outcomes. Efficacy beliefs play an important role in determining one's coping behaviours in the face of obstacles and aversive experiences and their ability to self-regulate affective states (Bandura, 1997). As such, it is argued that perceived inefficacy to cope with stressful situations contributes to feelings of depression (Bandura, 1997). Consistent with this contention, a negative association between perceived self-efficacy belief and the onset and maintenance of depressive symptoms has been observed (Bandura, 1997; Bandura, Pastorelli, Barbaranelli & Caprara, 1999). Bandura (1997) contends that the most influential source of efficacy information is personal mastery experiences; for that reason, treatments that include the opportunity for mastery experiences will be successful in enhancing coping behaviours. Within an exercise-based context the development of perceived physical competencies in performing tasks, self-regulating exercise behaviours, setting exercise goals and positive social support from others all contribute to feelings of mastery (Craft, 2005;

Ryan, 2010). Enhanced exercise self-efficacy (i.e., the confidence one has in their physical ability to perform exercise activities) is therefore a prospective mediator of the antidepressant effect of exercise in its own right (Bodin & Martinsen, 2004; Craft, 2005; Ryan, 2008, 2010; White et al., 2009). It is notable that self-efficacy as a mechanism of therapeutic change has not been studied extensively. Nonetheless, support has been observed for a temporal relationship between change in self-efficacy and change in depression as a result of exercise (Bodin & Martinsen, 2004; Craft, 2005; White et al., 2009). White and colleagues (2009) provide evidence that increased self-efficacy in the early stages of engaging in exercise behaviour is potentially causally related to improvements in depression. However, the authors highlight the necessity for more robust research to provide greater insight into the relationship between change in exercise self-efficacy and depression within a structured exercise programme.

With respect to research to support the independent effects of physical self-concept and global self-esteem on depression, only one study up to now has longitudinally investigated the temporal relationship of change among these variables. Findings from White, Kendrick and Yardley (2009) indicate that change in both physical self-concept and global self-esteem may potentially mediate the beneficial effect of exercise on depression. White and colleagues were unable to draw conclusions as to causal relationships among these variables, indicating that physical self-concept and global self-esteem may exert independent effects on depression. However, their study was exploratory, limited by a small participant sample and lacked a comparative control condition. Thus, there is a need for further research in this area employing a controlled repeated-measures design to fully explore the mediating potential of self-esteem and physical self-concept in explaining the exercise-depression relationship.

Thus far no study has examined psychological mechanisms of change among an exclusively male adult population. Evidence for causal mediating processes depends largely on the study design with Randomised Control Trials (RCTs) conferring the strongest type of evidence by providing both temporality and randomisation (MacKinnon et al., 2007; Shadish, Cook & Campbell, 2002). This RCT was designed to explore global self-esteem, physical self-concept and exercise self-efficacy as mechanisms of therapeutic change in men participating in an exercise intervention relative to a sedentary control group. Of particular interest in the present study was the temporal pattern of change in potential mediators and depression over the 10-week intervention period. It was hypothesised that participants in the exercise condition would experience a significant decrease in self-reported depression symptoms and that this effect would be mediated by change in global self-esteem, physical self-concept and exercise self-efficacy.

## Method

### *Participants*

Sixty-nine men aged 18-39 years participated in this study. Self-report measures and physician assessment revealed that all participants were sedentary (defined as exercising once per week or less), without major physical health problems that would prevent them from participating in exercise and were not in receipt of any psychiatric or antidepressant treatment.

## *Design*

The present study was part of a larger 10-week RCT examining the effects of exercise and psychotherapeutic interventions on the mental health of young men; approval to conduct this research was granted by the institutional Human Subjects Review Board. Participants enrolled in the initial RCT were randomly assigned to one of four study conditions. For the purpose of the current study, participants assigned to the exercise intervention (E,  $n = 38$ ) and the control condition (C,  $n = 31$ ) participated in additional data collection. Following condition assignment, participants met with the main researcher to provide written informed consent and complete baseline questionnaires. Participants completed study questionnaires again at weeks 5 and 10.

## *Intervention Protocol*

### *Control*

Throughout the 10-week study period, participants allocated to the control condition were asked to refrain from participating in any organised or structured exercise. Participants were subsequently offered use of the gym facilities upon completion of the study.

### *Exercise Intervention*

Participants allocated to the exercise intervention condition were asked to attend a maximum of twenty exercise sessions at the university gym over the 10 week intervention period. Each session was structured to last 55 minutes and consisted of independent moderate intensity aerobic and resistance training comprising a 10 minute warm-up, 40 minutes of intermittent exercise, and a 5 minute warm-down. Prior to the study commencing participants attended an initial familiarisation session at the university gym. At this session, participants completed a standard exercise screening

form and met with the study physician for a pre-exercise physical examination. Participants responded to questions taken from the Physical Activity Readiness Questionnaire (PAR-Q; Thomas, Reading & Shephard, 1992). No participant was found to have a medical condition that would put him at risk during exercise or exclude him from participation in the study. Participants also received a demonstration on how to safely use the gym equipment and participated in a supervised aerobic training session. During the familiarisation visit the researcher also explained that, at each exercise session, participants would be required to exercise to moderate heart rate intensity for no less than 35 minutes which they could self check using a heart rate monitor. Moderate heart rate intensity range was calculated as 70-80% of age-based maximal heart rate (Dunn, Trivedi, Kampert, Clark & Chambliss, 2005).

### *Measures*

#### *Depression*

The Beck Depression Inventory-2<sup>nd</sup> Edition (Beck, Steer & Brown, 1996) was used to measure the presence and severity of somatic and affective symptoms consistent with depression. The BDI-II is a 21-item instrument that asks participants to self-report symptom severity on a 4-point scale ranging from 0 to 3. A total BDI-II score of 13 or less is within the minimal range of symptom severity, a total score ranging between 14 and 28 is considered mild/moderate and between 29 and 63 is considered indicative of severe depression. The BDI-II has been validated with both psychiatric and normative populations and has been shown to have good reliability (Beck, Epstein, Brown & Steer, 1988). Cronbach alpha coefficient for the BDI-II in this study was .89.



### *Global Self-Esteem*

The eight-item Global Self-Esteem (GSE) subscale of the Physical Self-Description Questionnaire (PSDQ; Marsh, Richards, Johnson, Roche & Tremayne, 1994) was used as a measure of overall self-esteem in the current study. The PSDQ is a 70-item multidimensional instrument designed to measure GSE, overall physical self-concept and nine physical self-concept sub-domains. Responses to each item are rated on a six-point true-false scale and a number of the statements are negatively worded. Following reverse scoring for negatively worded items, a total score for each subscale is calculated by averaging responses to corresponding items for that subscale, with higher scores indicating higher feelings of physical self-concept. The GSE subscale includes such items as “Overall, I have a lot to be proud of” and “Nothing I ever do seems to turn out right”. The PSDQ has demonstrated good reliability and validity with adolescent and adult populations (Asci, 2003; Marsh et al., 1994; Moore, Andrew & Bartholomew, 2005). Previous research has also reported good internal consistency across all the 11 subscales with coefficient alpha estimates ranging from .82 to .92 (Marsh, 1996; Moore et al., 2005). Cronbach alpha coefficient for the GSE subscale in this study was .88.

### *Physical Self-Concept*

The Physical Self-Concept (PSC) subscale of the PSDQ was used to measure general physical self-perceptions. The six-item subscale includes such items as “I feel good about the way I look and what I can do physically” and “Physically, I feel good about myself.” In this study the Cronbach alpha coefficient for this subscale was .93.

### *Exercise Self-Efficacy*

The six-item Sports Competence subscale of the PSDQ was employed to provide a measure of exercise self-efficacy. The statements comprising this subscale reflect mastery experiences gained from engaging in exercise-based tasks and from

successfully self-regulating exercise related behaviours, for instance, “I have good sport skills.” In this study the Cronbach alpha coefficient for this subscale was .93.

### *Heart Rate*

At each exercise session participants wore an individual heart rate monitor (Polar RS400). Each heart rate monitor consisted of a transmitter belt and the RS400 watch which allowed participants to monitor their own heart rate. Heart rate data was analysed using the Polar ProTrainer 5 software.

### *Data Analysis*

To check for baseline group differences on demographic information and all variables of interest independent samples *t*-tests and Fisher exact tests were employed. Baseline relationships amongst the main variables were also explored by Pearson product-moment correlation analysis. Of the 38 participants randomised to receive the exercise intervention condition 61% completed post-intervention measures while 77% of the 31 participants randomised to the control condition completed post-intervention measures (see Figure 5.1). One participant in the exercise intervention condition was identified as an outlier and thus excluded from all statistical analysis.

Mediation was assessed based on traditional procedures outlined by Baron and Kenny (1986) and the extended recommendations of Stice, Presnell, Gau and Shaw (2007) who propose that the following criteria must be met for mediation to be possible: (1) participants in the treatment condition show significantly greater change on the outcome over time than do controls; (2) participants in the treatment condition show significantly greater change on the mediator over time than do controls; (3) change in the mediator over time is significantly correlated with change in the outcome over time in the treatment condition; (4) the effect of treatment condition on change in the

outcome should be attenuated when change in the mediator is statistically controlled; and (5) change in the mediator should occur before change in the outcome in the treatment condition.

Mediation analyses were performed using linear mixed effects regression modelling. Linear mixed effects regression analysis easily accommodates missing values in an intent-to-treat analysis and is therefore considered advantageous for the investigation of longitudinal mediation processes (Cerin, 2010; Kenny, Korchmaros & Bolger, 2003; Snijders & Bosker, 1999). Treatment condition, time and condition by time interaction were included as fixed effects and the participant was included as a random effect in all models. Between group effect sizes were calculated according to Hedges' *g*. For statistical analysis an alpha level of .05 was set. Change scores were computed for depression and each of the potential mediators between baseline (i.e., week 0) and week 5 and for depression between week 5 and post-treatment (i.e., week 10). Pearson product-moment correlation coefficients between change in the potential mediators with change in the outcome for the exercise intervention condition were then calculated to fulfil the third step of mediation. Where appropriate, linear mixed effects regression analysis was employed to assess the fourth step of mediation. To examine a time-line of change amongst the variables in the treatment condition, the fifth step of mediation was assessed by comparing changes in the potential mediators with changes in the outcome both during and after treatment as recommended by Stice and colleagues (2007) and Kazdin and Nock (2003).

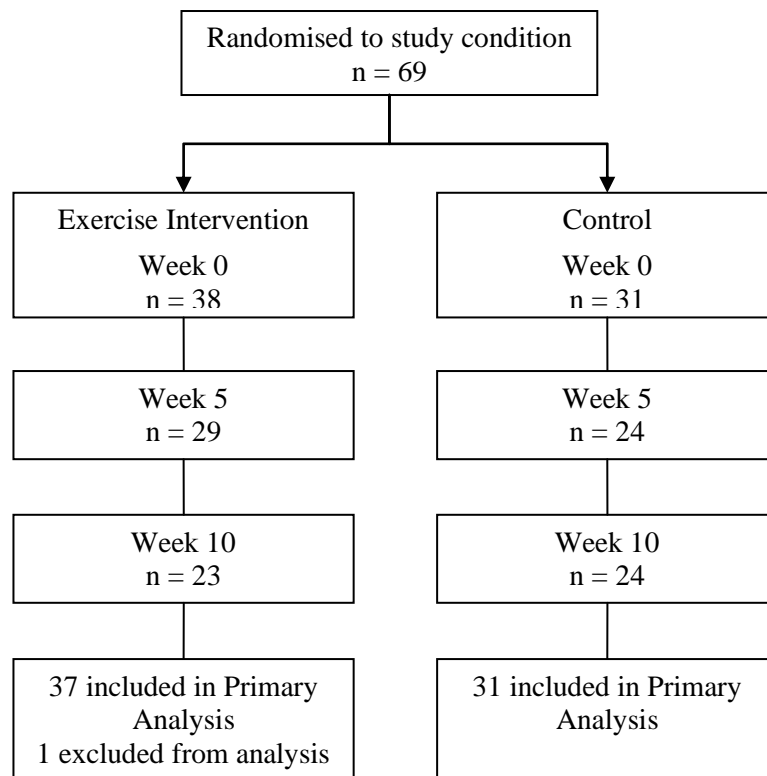


Figure 5.1. Participant flow through the study

## Results

### *Descriptive Statistics*

Pearson product correlation analysis revealed small to moderate correlations among the variables of interest at baseline. Not all correlations reached statistical significance; however, all correlations were in the expected direction (see Table 5.1). The mean (SD) age of the sample included in this study was 28.28 (6.01) years; 97% were Caucasian and 3% reported 'mixed' ethnicity. The majority of the sample were also single (65%), in full-time employment (70%), and possessing either a graduate level (35%) or a post-graduate level education (35%). About half of participants (51%) reported exercising once per week prior to taking part in the study and half were not

engaged in any form of exercise (49%). Mild/moderate to severe levels of depressive symptoms was reported by 21% of participants at baseline.

Preliminary baseline comparisons revealed that there was a significant difference between intervention and control baseline scores for PSC. To adjust for initial differences, baseline PSC scores were included as a covariate in the relevant mixed effects regression model. The exercise intervention and the control condition did not differ on any of the remaining variables or demographic information (see Table 5.2).

Out of a maximum 20 gym sessions, participants in the exercise condition attended a mean (SD) of 9.54 (2.03) sessions at week 5 and 15.76 (2.55) sessions at post-intervention. Mean (SD) heart rate throughout the exercise sessions, recorded as beats per minute, was 141.9 (10.1) which is within the moderate intensity exercise range for men in this age group (American College of Sports Medicine, 2010). Individual analysis of heart rate data indicated that participants exercised within their moderate heart rate range for no less than 35 minutes at each session.

Table 5.1.

Zero-Order Correlations Among Variables at Baseline

	1	2	3	4
1. DEP	1.00			
2. GSE	-.30*	1.00		
3. PSC	-.32**	.57**	1.00	
4. ESE	-.19	.48**	.49**	1.00

Abbreviations: DEP = Depression; GSE = Global Self-Esteem; PSC = Physical Self-Concept; ESE = Exercise Self-Efficacy.

\* Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

Table 5.2.

## Participant Baseline Characteristics by Study Condition

Variable	Exercise n = 37	Control n = 31	Total n = 68	<i>P</i> Value
Age, mean years (SD)	28.73 (6.11)	27.74 (5.94)	28.28 (6.01)	.50 <sub>a</sub>
Age Range, years	18 – 38	18 – 39	18 - 39	
Ethnicity				.71 <sub>b</sub>
Caucasian, n (%)	36 (97)	30 (97)	66 (97)	
Other, n (%)	1 (3)	1 (3)	2 (3)	
Marital Status				.34 <sub>b</sub>
Single, n (%)	27 (73)	17 (55)	44 (65)	
Married, n (%)	7 (19)	7 (23)	14 (20)	
Cohabiting, n (%)	2 (5)	4 (13)	6 (9)	
Separated, n (%)	1 (3)	1 (3)	2 (3)	
Divorced, n (%)	0 (0)	2 (6)	2 (3)	
Exercise Behaviour				.64 <sub>b</sub>
Not exercising, n (%)	19 (51)	14 (45)	33 (49)	

Exercising once/week, n (%)	18 (49)	17 (55)	35 (51)	
Employed, n (%)	26 (70)	21 (68)	47 (70)	.51 <sub>b</sub>
Education Level				.34 <sub>b</sub>
No formal Education, n (%)	1 (3)	0 (0)	1 (2)	
Secondary, n (%)	13 (35)	6 (19)	19 (28)	
Graduate, n (%)	11 (30)	13 (42)	24 (35)	
Postgraduate, n (%)	12 (32)	12 (39)	24 (35)	
Currently Smoking, n (%)	17 (46)	14 (45)	31 (46)	.57 <sub>b</sub>
Consume Alcohol, n (%)	31 (84)	30 (97)	61 (90)	.12 <sub>b</sub>
Weekly units of Alcohol, m(SD)	19.65 (19.69)	18.58 (14.45)	19.16 (17.38)	.80 <sub>a</sub>
BDI-II, m (SD) <sub>c</sub>	8.78 (7.10)	7.68 (7.10)	8.23 (7.13)	.53 <sub>a</sub>
Global Self-Esteem, m (SD) <sub>c</sub>	4.94 (0.84)	5.29 (0.84)	5.12 (0.84)	.08 <sub>a</sub>
Physical Self-Concept, m (SD) <sub>c</sub>	3.31 (1.18)	4.41 (1.18)	3.86 (1.18)	<.01 <sub>a</sub>
Exercise Self-Efficacy, m (SD) <sub>c</sub>	3.50 (1.32)	3.83 (1.32)	3.66 (1.32)	.30 <sub>a</sub>

Abbreviations: BDI-II = Beck Depression Inventory-2<sup>nd</sup> Edition; n = number

<sub>a</sub> Independent samples *t*-test, <sub>b</sub> Fisher Exact test, <sub>c</sub> Adjusted mean (SD) score.

*Step 1: Relationship between treatment condition and depression*

Linear mixed effects regression analysis revealed a significant main effect of time  $F(2, 45) = 5.03, p < .05$ , and condition by time interaction  $F(2, 45) = 14.86, p < .01$  for depression scores. Planned comparisons for depression scores across the three time points were examined to explore changes over time for each condition and to examine significant condition by time interactions. Time significant changes were observed for the exercise condition between week 0 and week 5  $t(50) = 4.71, p < .01$  and between week 0 and week 10  $t(48) = 6.18, p < .01$ . No time significant changes for the control group were observed. Significant differences in depression scores were observed between the intervention and control group at week 5  $t(53) = -2.53, p < .05$ , effect size -0.70, and again at week 10  $t(54) = -2.99, p < .01$ , effect size -0.88. Given that participants in the exercise condition showed significantly greater change on BDI-II scores over time compared to control, the first criterion for mediation was met. Adjusted mean total scores for depression over time for the intervention and control conditions are presented in Table 5.3 and depicted graphically in Figure 5.2.

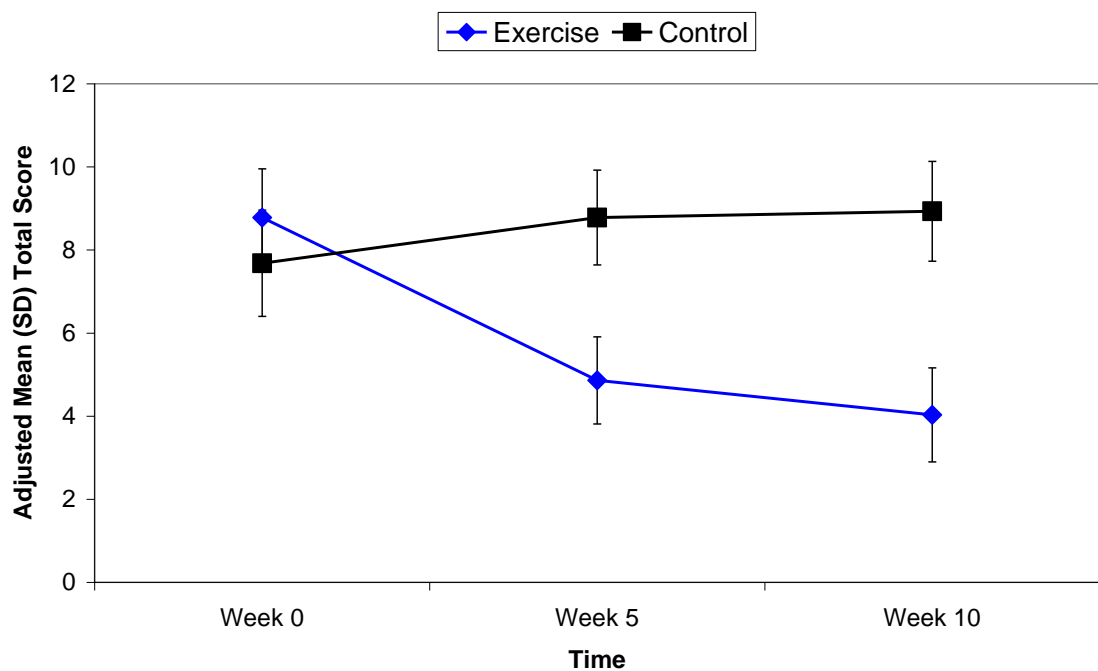


Figure 5.2. Adjusted mean scores for BDI-II across time.



Table 5.3.

Adjusted Means and Standard Deviations across time.

Variable	Condition	Adjusted means (SD)		
		Week 0	Week 5	Week 10
Depression	Exercise	8.78 (7.10)	4.89 (5.56)	4.03 (5.28)
	Control	7.68 (7.10)	8.78 (5.59)	8.93 (5.85)
Global Self-Esteem	Exercise	4.94 (0.84)	5.29 (0.62)	5.21 (0.64)
	Control	5.29 (0.84)	5.37 (0.63)	5.36 (0.72)
Physical Self-Concept <sub>d</sub>	Exercise	3.72 (0.60)	4.57 (0.60)	4.59 (0.59)
	Control	3.88 (0.61)	4.11 (0.59)	4.18 (0.59)
Exercise Self-Efficacy	Exercise	3.50 (1.32)	3.91 (1.25)	3.89 (1.01)
	Control	3.83 (1.32)	4.03 (1.26)	4.00 (1.12)

<sub>d</sub> Adjusted mean (SD) scores that control for significant baseline differences are presented: covariate Baseline PSC = 3.7922.

*Step 2: Relationship between treatment condition and potential mediators*

*Global Self-Esteem.* A significant main effect for time  $F(2, 48) = 7.58, p < .01$  was found for GSE scores and the condition by time interaction effect was non-significant  $F(2, 45) = 3.26, p > .05$ . According to the second criterion for mediation, treatment condition should predict change in the mediator. As the exercise intervention condition did not significantly differ from the control group on scores across time for global self-esteem, this variable does not meet the requirements for mediation. With respect to the significant main effect for time, planned comparisons on the GSE slope coefficients across the three time points revealed time significant changes for the intervention group between week 0 and week 5  $t(58) = -4.49, p < .01$  and between week 0 and week 10  $t(52) = -2.69, p < .01$ . No other statistically significant changes across time points were observed. See Table 5.3 and Figure 5.3 for adjusted mean scores over time for the intervention and control condition on GSE.

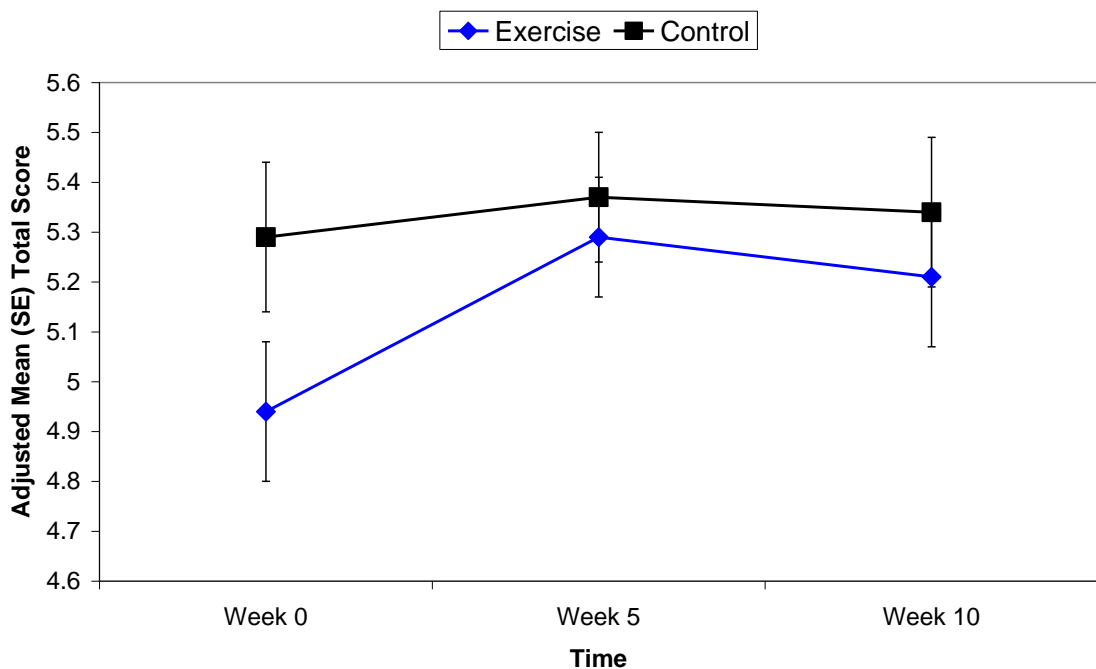


Figure 5.3. Adjusted mean scores for Global Self-Esteem across time.

*Physical Self-Concept.* When baseline group differences in PSC scores were statistically controlled for, mixed effects regression analysis revealed a significant main effect of time  $F(2, 114) = 23.72, p < .01$ , and condition by time interaction  $F(2, 114) = 6.54, p < .01$ . Planned comparisons across the three time points were examined to explore changes over time for the intervention and control condition and to examine significant condition by time interactions. Time significant changes were observed for the exercise condition between week 0 and week 5  $t(116) = -6.70, p < .01$  and between week 0 and week 10  $t(120) = -6.11, p < .01$ , and for the control condition between week 0 and week 10  $t(115) = -2.21, p < .05$ . No other statistically significant changes across time points were observed. Significant condition differences in PSC scores between the intervention and control condition were revealed at week 5  $t(143) = 2.66, p < .01$ , effect size 0.76, and again at week 10  $t(148) = 2.11, p < .05$ , effect size 0.64, fulfilling the second requirement for mediation. Adjusted mean total scores for PSC over time that control for significant baseline differences (covariate baseline PSC = 3.7922) are presented in Table 5.3 and Figure 5.4.

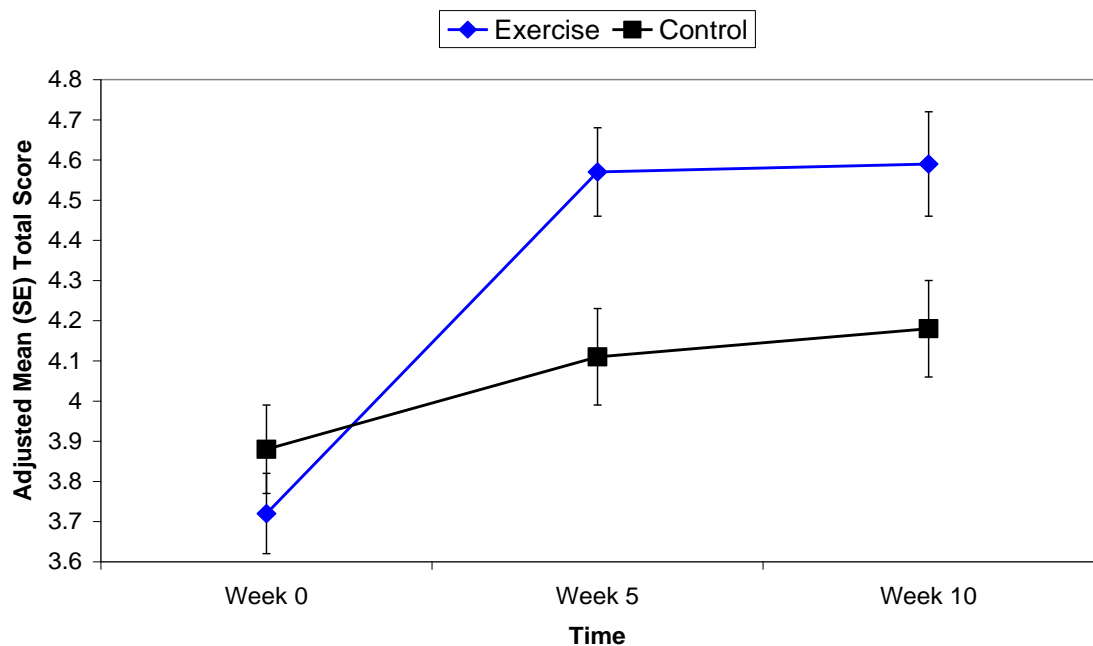


Figure 5.4. Adjusted mean scores for Physical Self-Concept across time controlling for baseline differences (covariate baseline PSC = 3.7922)

*Exercise Self-Efficacy.* For exercise self-efficacy scores a significant main effect for time  $F(2, 50) = 4.90, p < .05$  and a non-significant condition by time interaction effect  $F(2, 50) = 0.61, p > .05$  was found. Given that the exercise intervention condition did not significantly differ from the control group on scores across time for exercise self-efficacy, this variable failed to meet the second requirement for mediation. Planned comparisons across the three time points for each study condition revealed time significant changes for the intervention group between week 0 and week 5  $t(51) = -3.03, p < .01$  and between week 0 and week 10  $t(54) = -2.69, p < .01$ . No time significant changes were observed for the control group. Adjusted mean scores for exercise self-efficacy over time for the intervention and control condition are presented in Table 5.3 and Figure 5.5.

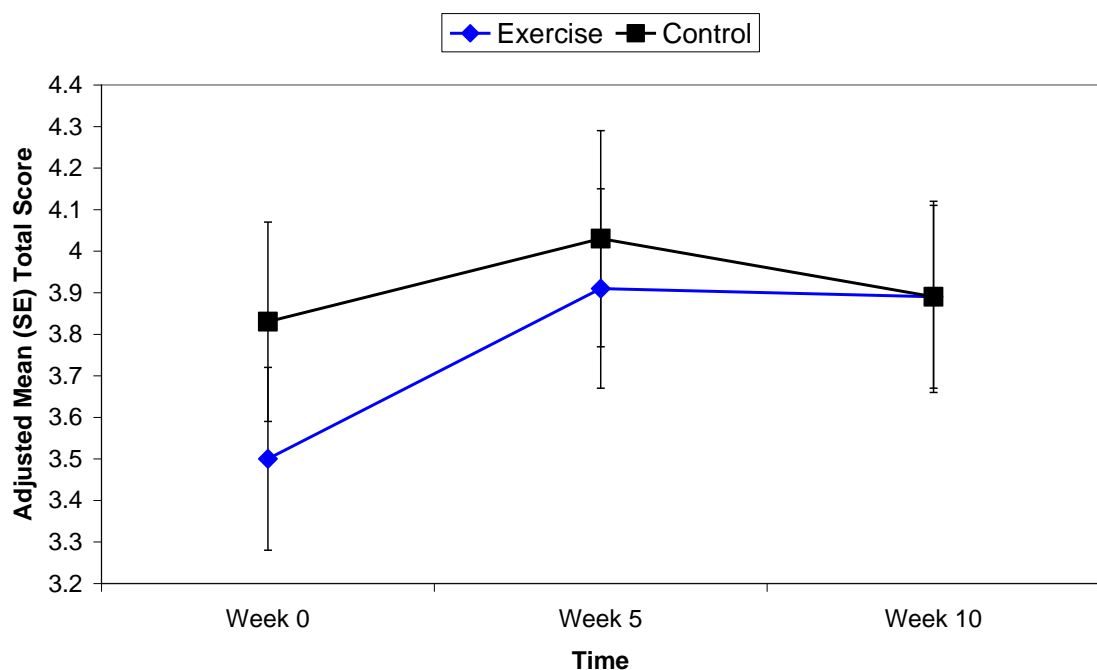


Figure 5.5. Adjusted mean scores for Exercise Self-Efficacy across time.

*Step 3: Relationship between potential mediators and depression*

Pearson product-moment correlation coefficients examined the relationship of change in the potential mediators with change in depression for the exercise intervention condition (see Table 5.4). Correlation analysis between change in the potential mediators from week 0 to week 5 with change in depression from week 0 to week 5 revealed that, with the exception of GSE, correlations were small to moderate and in the expected direction. Early increases in PSC scores were significantly associated with early decreases in depression scores, fulfilling the third requirement for mediation. With regard to the relationship between early change the potential mediators (i.e., from week 0 to week 5) and late change in depression (i.e., week 5 to week 10), correlations were not in the hypothesised direction.

Table 5.4.

Zero-Order Correlations between Change in Potential Mediators and Change in Depression for the Treatment Condition

Potential Mediator	$\Delta M_{wk0-wk5}$ with $\Delta D_{wk0-wk5}$	$\Delta M_{wk0-wk5}$ with $\Delta D_{wk5-wk10}$
	Exercise n = 28	Exercise n = 22
Global Self-Esteem	.13	.19
Physical Self-Concept	-.38*	.43*
Exercise Self-Efficacy	-.19	.50*

\* Correlation is significant at the 0.05 level (2-tailed).

*Step 4: Relationship between treatment condition and depression after controlling for mediating variables*

Physical self-concept was the only potential mediator to satisfy the second and third steps for mediation delineated by Stice and associates (2007). Linear mixed effects regression modelling was therefore employed to assess whether the effect of treatment condition on depression scores was significantly attenuated after controlling for the mediator. Analysis revealed that statistically controlling for early change in PSC scores did not attenuate the relationship between treatment condition and depression. For depression the main effect for time remained significant  $F(2, 95) = 4.59, p < .05$ , as did the condition by time interaction effect  $F(2, 95) = 16.44, p < .01$ .

*Step 5: The temporal relation of change*

The specific time effects reported in the linear mixed effects regression analysis presented above provide insight into the temporal relationship of change for depression and each of the potential mechanisms for the exercise intervention condition. Planned comparisons conducted on significant main effects for time revealed that most of the reduction in depression scores had occurred between weeks 0 and 5,  $t(50) = 4.71, p < .01$ , with no further significant decrease between weeks 5 and 10,  $t(45) = 1.39, p > .05$ . This pattern of change over time corresponds to the time-line of change observed for all of the potential mediators. Significant time changes were found for improvement in global self-esteem from weeks 0 to 5,  $t(58) = -4.49, p < .01$ , with no further significant changes occurring between weeks 5 and 10,  $t(44) = 1.44, p > .05$ . Significant improvement in physical self-concept occurred between weeks 0 and 5,  $t(116) = -6.70, p < .01$ , while no further significant changes were found for scores between weeks 5 and 10,  $t(111) = 0.05, p > .05$ . Yet again, significant improvements in scores for exercise

self-efficacy occurred between weeks 0 and 5,  $t(51) = -3.03, p < .01$ , with no further significant change in scores between weeks 5 and 10,  $t(49) = 0.14, p > .05$ .

For all variables, the effect of time remained significant from week 0 to week 10, indicating that the improvements attained by week 5 were maintained whilst participants continued to exercise.

## Discussion

The present study contributes to the extant research on mechanisms of psychological change in exercise treatment for symptoms of depression in a number of ways. Specifically this is the first study to longitudinally examine processes of therapeutic change in men engaged in a structured exercise programme relative to a sedentary control group. By simultaneously investigating a number of potential mediators in the same research design this study promotes greater conceptual understanding of the processes responsible for the antidepressant effect of exercise. Following from the recommendations of Kazdin and Nock (2003), we assessed change in putative mechanism and depression scores concurrently allowing us to build on previous research by establishing a time-line of change amongst the variables.

A key finding from this study was that the beneficial effect of exercise on self-reported depressive symptoms among men occurred rapidly. For those in the exercise intervention group most of the reduction in depression scores had occurred by week 5 with no further significant change after this point. These findings are consistent with research indicating that exercise therapy may have a 'rapid response' effect on reducing depressive symptoms, whereby most of the improvement occurs within the first few weeks of engaging in exercise (Chu et al., 2009; Craft, 2005; Foley et al., 2008; Knubben et al., 2007; White et al., 2009). This suggests that exercise therapy may exert an efficacious immediate effect on depressive symptoms and for this reason exercise is likely to be beneficial for treating symptoms of depression either alone or as an adjunct to conventional treatments.

As a significant reduction in depression was detected so early in this study it was not possible to determine whether change in any of the potential mediators preceded and caused change in depression. Consideration of the time-line of change in the potential



mediators does however provide insight into the effects of exercise on the psychological mechanisms of interest. Interestingly, positive changes in all of the potential mediators for the exercise group mirrored the temporal pattern of change in depression scores over time. Participants in the exercise condition reported significantly improved perceptions of exercise self-efficacy, PSC and GSE by week 5 and this was maintained at post-intervention. Such findings demonstrate that exercise exerts a rapid beneficial effect on both depression and the putative mediators examined in this study. Theoretically, GSE is viewed by many as a relatively stable construct and not easily changeable within a short time period; however, findings from empirical studies investigating exercise induced change in GSE have been equivocal. The rapid improvement in GSE observed in exercisers in this study is consistent with the findings of White and colleagues (2009), suggesting that self-reported GSE can be rapidly improved within the context of an exercise programme. In the current analysis, change in self-efficacy, PSC or GSE was not found to mediate the effect of exercise on change in depression. However, given that exercise self-efficacy, PSC and GSE improved at the same time as depression severity decreased, it is likely that these variables are important factors associated with the antidepressant effects of exercise. In terms of causality, it may be that the mechanisms proposed in this study are in fact causally related to the antidepressant effect of exercise but that the mid-treatment assessment was conducted too late to detect temporal precedence. This limits the interpretation of temporal precedence of potential mediators in relation to change in depression. As such, further research which necessitates earlier assessment of change in depression and each of the potential mediators is needed.

While it is encouraging that significant reductions in depression occurred rapidly as a result of this exercise intervention, it is questionable whether a programme of

shorter duration (e.g., 5 weeks) would be conducive to promoting longer-term adherence to exercise among sedentary men and the resulting long-term benefits to mental health. Participants in the exercise group maintained the significant reduction in depressive symptoms while they continued to exercise up to the end of the study. A limitation of this study was that we did not investigate the long-term effects of the exercise intervention. Since we did not include a follow-up analysis of exercise involvement or levels of depression among the exercisers it is not known whether symptom reduction persisted in those who failed to adhere to an exercise programme. Nor is it apparent whether we would observe further significant reductions in depression among those who continued to exercise beyond study participation and whether any of the proposed mechanisms would mediate longer-term benefits. Longer-term adherence to exercise and related therapeutic benefits should be addressed in future studies.

The strongest relationship to emerge for exercisers in this study was between an increase in PSC and a decrease in depression scores during the early stages of the intervention (i.e., from weeks 0 to 5). The examination of the temporal relation of change among these variables indicates that for men exercise induced changes in perceptions of the physical self presents a potential mechanism for initial change in depression. This finding extends the evidence presented by White and colleagues (2009) for a temporal pattern of change among physical self-perception and depression by investigating these variables within the context of a controlled exercise intervention trial. In terms of potential psychological mediators of the antidepressant effect of exercise, it is encouraging that a significant association between improvement in PSC and reduction in depression for the exercise condition was found. However, it is important to note that the mechanisms investigated in the present study are not the only potential processes underpinning the therapeutic effects of exercise. According to

Hansen, Stevens and Coast (2001), the relationship between exercise and depression is complex and involves multiple pathways. It is likely that a combination of biological and psychosocial mechanisms influence this relationship (Fox, 1999), which may explain why change in PSC was not found to attenuate the significant effect of exercise on depression in this study. Nonetheless, given that the strongest relationship observed in this study was between increased PSC and decreased depression in the first five weeks of engaging in exercise, the findings from this study suggest that enhancing perceptions of the physical self may be an important component of exercise interventions which are targeted at benefiting depression. Research further suggests that improving physical self-perceptions is beneficial for promoting longer-term adherence to exercise programmes (Taylor & Fox, 2005).

In terms of a theoretical understanding of the mediating role of self-efficacy, PSC and GSE, our results are consistent with the longitudinal findings presented by White, Kendrick and Yardley (2009) in so far as all of the variables within EXSEM improved over time for those in the exercise intervention. The design and analysis employed in this study do not, however, fully elucidate the causal relations between change in self-efficacy, PSC, GSE and depression. As such, it remains unclear as to whether self-efficacy, PSC and GSE exert direct independent effects on depressive symptoms as proposed by Ryan (2008) or hierarchal effects consistent with the EXSEM framework (Sonstroem et al., 1994).

Consistent with Bandura's self-efficacy theory of behaviour change (1977, 1997) participants in the exercise condition reported significant increases in self-efficacy over time. According to Bandura (1977) personal mastery experiences are the primary source of efficacy beliefs and the exercise intervention employed in this study presented numerous opportunities for mastery in our formally sedentary sample. For

example, participants were encouraged to self-regulate behaviour by engaging in independent exercise and setting and achieving training goals. The intervention utilised in this study also proffered the opportunity to learn and master a number of new skills such as stretching, using various exercise equipment, and self-monitoring heart rate. These findings are similar to previous studies where self-efficacy in terms of perceived physical ability and task-specific confidence has been shown to improve as a result of exercise (Bodin & Martinsen, 2004; White et al., 2009). Although the negative relationship between change in exercise self-efficacy and depression did not reach statistical significance in this study the finding that both of these variables significantly improved between weeks 0 and 5 for the exercise intervention should not be overlooked. It is possible that given a larger sample size a statistically significant result would have been observed. Specifically, a larger sample size would accommodate the use of structural equation modelling which is a more robust analysis for statistical mediation (Cerin, 2010). A final limitation of these findings was the use of the sports competence subscale to measure exercise self-efficacy. A measure that addressed mastery experiences and feelings of confidence specific to a gym setting would have been more appropriate than the general measure of exercise-based self-efficacy employed in this study. Other measures of exercise self-efficacy that may be appropriate for inclusion in future mediation studies include the Self-Efficacy for Exercise (SEE) Scale (Resnick & Jenkins, 2000), the Exercise Self-Efficacy Scale (EXSE; McAuley, 1993) and Bandura's Exercise Self-Efficacy Scale (ESES; 2006).

In terms of design, this RCT builds on previous research by simultaneously examining a number of potential mechanisms of change within a longitudinal mediation model (MacKinnon et al., 2007). The design and findings of this study will prove useful in informing the design of future mediation studies. For example, future research

should include earlier and more frequent assessments of change among the variables to better demonstrate evidence for temporal precedence, one of the more important considerations of causality (Kazdin, 2007; Kazdin & Nock, 2003). In addition, the identification of mechanisms of therapeutic change requires congruent evidence from different settings and samples (Kazdin & Nock, 2003; MacKinnon et al., 2007). Future research should therefore replicate observed effects in different samples and conditions.

In investigating the relationship between change in the mediator and change in the outcome over time in the treatment group, a positive association was found between early change in all three potential mediators and late change in depression. It is likely that the reduced sample size at weeks 5 and 10, together with the finding that all significant reductions in depression scores had occurred by week 5 explains this unexpected positive relationship. Finally, baseline group differences were observed for PSC scores. In this study, randomisation procedures were employed to reduce such bias; however, it may be possible that informing participants of condition allocation influenced their response to questions at the baseline assessment. Conversely, it was felt that if participants were informed of group allocation following completion of baseline measures that this would lead to a potentially higher drop-out rate. As such, questions remain regarding when to inform participants of condition allocation in relation to baseline assessment in RCTs and should be taken into account in future trials.

In sum, the analysis employed in the current study did not find support for change in exercise self-efficacy, physical self-concept, or self-esteem as mediators of the therapeutic relationship between exercise and symptoms of depression. The results of this study do, however, suggest that improvements in depression, exercise self-efficacy, physical self-concept, and self-esteem occur rapidly as a result of engaging

with exercise. Based on the temporal pattern of change observed for variables investigated in this study it is possible that change in exercise self-efficacy, physical self-concept and self-esteem do play a mediating role in the antidepressant effects of exercise and that further research is needed to uncover the causal relationships between change in putative mediators and improvement in depression.

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## **CHAPTER 6**

### **GENERAL DISCUSSION**

This thesis examined the effectiveness of alternative interventions for facilitating help-seeking behaviour and improving the mental health of young adult men. Study 1 (*chapter 2*) and study 3 (*chapter 4*) sought to examine the efficacy of combined exercise and psychotherapeutic strategies for mental health among men. Specifically, study 1 investigated the effectiveness of an integrated team sport/psychosocial intervention (i.e., Back of the Net; BTN programme) and study 3 explored the effectiveness of a combined programme of structured exercise and internet delivered cognitive behavioural therapy (CBT) for young men's mental health. With respect to exploring the potential of sport as a vehicle for mental health promotion, studies 1 and 3 utilised the context and language of sport to engage young men with the psychotherapeutic interventions. Study 2 (*chapter 3*) provided a qualitative exploration of participant's experiences and views on the implementation, receipt and setting of the sports-based psychosocial intervention employed in study 1. With respect to explaining the antidepressant effects of exercise observed in this research, study 4 (*chapter 5*) examined a number of putative psychosocial mechanisms of change. Taken together, the results of this thesis highlight the value of specifically tailored exercise and CBT-based programmes as alternative early intervention strategies for the promotion of positive mental health targeted at young adult males.

The aims of this research are consistent with calls from national mental health policies stressing the need for alternative, gender-focused, early intervention research (Department of Health and Children; DoHC, 2006, 2008; Health Service Executive; HSE, 2005; Tedstone Doherty & Kartalova-O'Doherty, 2010; Ward, Tedstone Doherty & Moran, 2007; Wilkins & Savoye, 2009). The combined exercise and psychotherapy interventions developed, implemented and evaluated in studies 1, 2 and 3 take a preventative approach to mental health. By targeting a non-clinical community sample

of young adult males these combined interventions aim to equip men with the strategies to cope with minor levels of distress and protect against escalation of problems. Few researchers have previously explored possible links between exercise and CBT as therapeutic strategies for improving mental health (Faulkner & Biddle, 2001; Mead et al., 2009). As such, the alternative mental health interventions investigated in this thesis are innovative in their approach to positive mental health promotion and significantly add to the help-seeking, physical activity and mental health literature.

It is important that mental health initiatives are implemented and evaluated on a pilot basis (Tedstone Doherty, Moran & Kartalova-O'Doherty, 2008). Taken together, studies 1 and 2 report on the effectiveness and acceptability of a pilot integrated exercise/CBT-based intervention (i.e., BTN), with collective findings providing an impetus for additional research in this area. The empirical findings reported in study 1 indicated that compared to a control condition, men who participated in the team-sport/CBT intervention and those who engaged in an independent aerobic training condition experienced significant decreases in depression scores. Specifically, over the 10-week intervention period, self-reported depression scores decreased by 45% for those in the BTN programme and by 52% for participants who engaged in an independent aerobic training condition. These findings support the effectiveness of exercise-based interventions for benefiting mental health and in particular highlight the utility of different types of exercise interventions for improving depressive symptoms. The positive treatment effect observed for men receiving the BTN intervention further provides longitudinal support to cross-sectional research reporting an inverse relationship between participation in team-sport and symptoms of depression (Boone & Leadbeater, 2006; Dishman et al., 2006; Paffenbarger, Lee & Leung, 1994).



The inclusion of a qualitative study (i.e., study 2) within this research permitted a comprehensive interpretation of the empirical results presented in study 1 and the findings report positively on the perceived usefulness, attractiveness and acceptability of sport as a vehicle for mental health promotion. Specifically, the qualitative findings from study 2 draw attention to the success of the BTN programme in providing an openly accessible and socially acceptable source of support for young adult males. Results from study 2 indicated that young males perceived the structure and atmosphere of the BTN programme to be conducive to reciprocal problem sharing. These findings support recommendations that bringing men together in supportive therapeutic environments can foster group support and learning (Addis & Mahalik, 2003; DoHC, 2006). A key finding from study 2 was that the context and language of sport facilitated group discussion and learning on issues related to mental health. This is consistent with Pringle's (2009) contention that football has a positive role to play in mental health promotion and in the delivery of interventions. As far as we are aware study 1 was the first randomised control trial to make use of sport as a vehicle for mental health promotion and qualitative findings from study 2 indicate that sport provides a promising method for increasing uptake of support among men. By linking psychotherapy strategies with team sports, the environment created in study 1 was perceived as an innovative and accessible format for engaging young men and fostering attitude and behaviour change among the target demographic. Perceptions of normativeness have been shown to positively influence help-seeking behaviour (Addis & Mahalik, 2003) and this is consistent with the qualitative findings of study 2. Men reported that the social aspect of participating in a team sport normalised the therapeutic process and was fundamental to the attraction of the BTN programme as a mental health promotion strategy. Multi-method evaluation of the pilot BTN programme demonstrates the

potential for combining low-intensity interventions to actively promote strategies for developing good mental health among targeted populations.

In building on the findings of studies 1 and 2, the randomised controlled trial employed in study 3 sought to develop, implement and evaluate the effectiveness of a sports-based internet delivered CBT intervention (i.e., *LifeFit*) combined with an exercise programme as a strategy to improve the mental health of young men. With respect to the effectiveness of this combined intervention, findings indicated that compared to the control group and an internet-delivered CBT only condition, men who participated in exercise components of this study experienced clinically significant reductions in depression symptoms. Therefore, the critical finding of this trial was that the combination of an exercise programme and CBT delivered via the internet was not beneficial for mental health beyond the effect of exercise therapy alone. Specifically, for men who were concurrently participating in both treatment strategies depression scores decreased by 51% while those participating in the exercise only intervention reported a post-intervention decrease of 54%. This finding strengthens the contention that exercise therapy is effective for the management of depressive symptoms at a community-level (Mead et al., 2009). Study 3 also draws attention to the value of the internet as a method for disseminating psychotherapeutic interventions among men (Burns, Durkin & Nicholas, 2009; Gallagher, Tedstone Doherty, Moran & Kartalova-O'Doherty, 2008), and further demonstrates the attractiveness of sport to engage young men in positive mental health promotion. In addition to the clinical potential of combined exercise and CBT-based interventions for improving mental health evidenced in studies 1 and 3, these type of alternative interventions have the potential to facilitate mental health help-seeking among young adult men. There is still much to learn about the value of combined interventions for mental health promotion; further research is

needed to examine the potential of combined strategies for reducing mental distress and addressing barriers to help-seeking specific to men.

An important step in informing the development of future intervention research and offering guidance to health professionals is the examination of mechanisms of change to identify how and why an intervention works (Taylor & Faulkner, 2008). It is likely that several interacting biophysical and psychosocial processes are responsible for therapeutic change as a result of exercise participation (Dunn, Trivedi & O'Neal, 2001). However, psychological benefits through exercise have been found independent of improvements in physical fitness or biochemical change (Veale et al., 1992) and researchers have urged that the psychosocial processes related to exercise demand further attention (Fox, 1999). The findings from study 4 add considerably to the limited research in this area. Most notably, no prior research has employed a longitudinal controlled research design and with the exception of White, Kendrick and Yardley (2009) no other research has investigated temporal precedence, a key criterion for determining causality. The design of study 4 highlights the complexity of the relationship between exercise and symptoms of depression by necessitating concurrent assessment of several psychosocial mechanisms of action. In addition, the findings from this study support the contention that no single theory will suffice to explain beneficial relationship between exercise and depression (Dunn et al., 2001; Hansen, Stevens & Coast, 2001; Scully et al., 1998). Future research will benefit from using more stringent data analysis such as structural equation modelling and giving methodological consideration to temporal precedence to further explore potential psychological mediators of change. Mediation analysis should also continue to investigate biophysical mechanisms of change in order to build a complete picture of the way in which exercise exerts a positive effect on depressive symptoms.

Studies 1, 3 and 4 reported that exercise therapy had a strong treatment effect on symptoms of depression among non-clinical community samples of young men. Using an intent-to-treat approach, these studies address methodological weakness of previous exercise intervention research. The effect sizes observed in this thesis are comparable to the large treatment effects previously observed in exercise intervention research for the management of clinical depression (Craft & Landers, 1998; Lawlor & Hopker, 2001; Mead et al., 2009). These findings are even more pertinent in light of the uncertainty surrounding the effectiveness of pharmacological treatment for mild to moderate depression (Donoghue & Tylee, 1996; Turner, Matthews, Linardatos, Tell & Rosenthal, 2008). It has further been reported that approximately 30% of individuals do not respond to pharmacotherapy (Knubben et al., 2007) and that the side effects associated with antidepressants deter many individuals from continuing treatment (Donoghue & Tylee, 1996). In addition to the large positive effect exercise exerts on depression, exercise programmes hold obvious advantages over established treatments (i.e., accessibility, minimal adverse side-effects, free from stigma) and thus should continue to be pursued as a treatment for individuals experiencing minor or transient levels of distress.

#### *Future Research*

The findings from this thesis advance our understanding of the effectiveness and acceptability of exercise and CBT-based interventions delivered within the context of sport for young men's mental health. The interventions described within this research demonstrate the potential of initiatives such as the BTN programme, *LifeFit* and structured exercise programmes as first line avenues of support for young men experiencing mental distress. Building on findings from this thesis, future research should continue to explore the context of sport and tailored internet programmes as

accessible and attractive methods for facilitating targeted mental health promotion. Research in this area will most likely be informed by qualitative analysis of male attitudes towards engaging with innovative strategies for mental health promotion. Empirical research is also needed to evaluate the effectiveness of interventions in improving mental health and in increasing the uptake of support among young adult men.

Study 4 of this thesis suggests that continued research into casual mediators of treatment effects may result in the development of more efficacious intervention programmes for mental health. Specifically, the findings from study 4 highlight the necessity for future mediation studies to assess the temporal precedence of potential psychological mechanisms in relation to change in depression within exercise trials. Studies 1, 3 and 4 add to current research suggesting that exercise has a rapid response on depression whereby most of the improvement in symptoms occurs within the first few weeks (Chu et al., 2009; Craft, 2005; White et al., 2009). In addition, findings from study 4 extends existing literature by showing that exercise has a rapid beneficial effect on other psychosocial processes, namely, global self-esteem, physical self-perception and exercise self-efficacy. Therefore, building on these findings, it is recommended that future mediation research might aim to measure change in potential mediating variables early on in treatment, prior to expected change in depression, and that this might even require a session-by-session assessment of change. More frequent assessment of change in each of the proposed mediators may also help elucidate the theoretical framework underpinning self-concept. For example, demonstrating a temporal relationship between changes in self-efficacy, physical self-concept and global self-esteem would provide support for the hierarchical framework proposed by the Exercise and Self-Esteem Model (Sonstroom, Harlow & Josephs, 1994). It is now

widely understood that antidepressants require a latency of several weeks before they show a therapeutic benefit (Knubben et al., 2007). This body of research showed that exercise exerts a rapid beneficial effect on several indices of mental health and for this reason may present a preferred treatment option for those experiencing distress.

Building on findings from this thesis and the work of others (e.g., Craft, 2005; White et al., 2009) further research is needed to firmly establish the time course of change and rapid response potential of exercise for mental health benefits among various populations including clinical samples.

Findings from this research indicate that exercise exerts a strong positive effect on mental health. For this reason increasing uptake and adherence to exercise programmes among young adult men should be a consideration for future research. In terms of increasing adherence to exercise-based programmes, research that examines the mediating mechanisms that drive the process of change may prove beneficial. For example, previous research reports that self-efficacy and physical self-concept may play a role in promoting longer-term adherence to exercise programmes (Dishman et al., 2005; Taylor & Fox, 2005). It is also likely that the matter of how best to increase recruitment and adherence to exercise programmes will ultimately be informed by community-based qualitative research investigating the views of young men in relation to programme structure and implementation. This recommendation is supported by the findings of study 2; participants who completed the BTN intervention reported that the programme environment, structure, implementation and the social support afforded by the group context promoted adherence.

Literature in relation to the long-term effectiveness of exercise for symptoms of depression is limited. It has been suggested that that exercise needs to be continued long-term in order to maintain mental health benefits (Babyak et al., 2000; Lawlor &

Hopker, 2001; Mead et al., 2009). Due to a poor follow-up response rate in study 1 and lack of follow-up in studies 3 and 4 the findings from this thesis are unable to substantially add to this contention. Questions remain as to whether formally sedentary men are likely to continue exercising upon completion of the intervention period, what factors motivate willingness to continue exercising, and what impact exercise would have on mental health over the longer-term. Thus, investigating the long-term maintenance of therapeutic benefit from exercise is an important area for future research. Attention should also be paid to uncovering potential mediators of long-term effects of exercise such as maintenance of benefit or further improvement in mental health. Longitudinal research would help address the above questions and elucidate the role psychosocial mechanisms might play in mediating long-term effects of exercise for mental health.

### *Conclusion*

This thesis addresses the present need for gender-specific alternative mental health interventions aimed at facilitating help-seeking and improving the mental health of young adult men. The findings stemming from this body of research clearly demonstrate that exercise and tailored psychotherapeutic interventions are effective for improving young men's mental health. Findings also highlight that the context of sports and the internet have a positive role to play in mental health promotion. Given the disparity between young men's experiences of distress and their help-seeking behaviour, in line with masculine gender-role socialisation theory (Addis & Mahalik, 2003), future research should continue to explore the value of positive mental health promotion strategies that utilise contexts congruent with male attitudes and normalise the therapeutic process for young men.

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## **APPENDICES**

## Appendices

1. Alcohol Questionnaire
2. Beck Depression Inventory-II
3. Medical Screening Questionnaire
4. Physical Self-Description Questionnaire
5. Post-Intervention Evaluation Questionnaire
6. Qualitative Questionnaire
7. Recruitment Advertisements
8. Social Provisions Scale

## Appendix 1

### Alcohol Questionnaire

How many days in a week do you typically drink alcohol? (*Please circle*)

0      1      2      3      4      5      6      7

On a day that you drink, how many units of alcohol would you typically consume on average? (*See below*)

**1 Unit** of alcohol is roughly equivalent to:

- Half a pint of beer, cider or lager
- A pub measure of fortified wine such as port or sherry
- A small (125ml) glass of wine

**1 ½ Units** of alcohol is roughly equivalent to:

- A pub measure of spirits

**2 Units** of alcohol is roughly equivalent to:

- A pint of beer, cider or lager
- A standard/large glass of wine

## Appendix 2

### Beck Depression Inventory – 2<sup>nd</sup> Edition

This questionnaire consists of 21 statements. Please read each group of statements carefully and then circle the **one** statement in each group that best describes the way you have been feeling during the **past two weeks, including today**. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group.

#### **1. Sadness**

- 0 I do not feel sad
- 1 I feel sad much of the time
- 2 I am sad all the time
- 3 I am so sad or unhappy that I can't stand it

#### **2. Pessimism**

- 0 I am not discouraged about my future
- 1 I feel more discouraged about my future than I used to be
- 2 I do not expect things to work out for me
- 3 I feel my future is hopeless and will only get worse

#### **3. Past failure**

- 0 I do not feel like a failure
- 1 I have failed more than I should have
- 2 As I look back, I see a lot of failures
- 3 I feel I am a total failure as a person

#### **4. Loss of Pleasure**

- 0 I get as much pleasure as I ever did from the things I enjoy
- 1 I don't enjoy things as much as I used to
- 2 I get very little pleasure from the things I used to enjoy
- 3 I can't get any pleasure from the things I used to enjoy



### **5. Guilty Feelings**

- 0 I don't feel particularly guilty
- 1 I feel guilty over many things I have done or should have done
- 2 I feel quite guilty most of the time
- 3 I feel guilty all of the time

### **6. Punishment Feelings**

- 0 I don't feel I am being punished
- 1 I feel I may be punished
- 2 I expect to be punished
- 3 I feel I am being punished

### **7. Self-Dislike**

- 0 I feel the same about myself as ever
- 1 I have lost confidence in myself
- 2 I am disappointed in myself
- 3 I dislike myself

### **8. Self-Criticalness**

- 0 I don't criticize or blame myself more than usual
- 1 I am more critical of myself than I used to be
- 2 I criticise myself for all of my faults
- 3 I blame myself for everything bad that happens

### **9. Suicidal thoughts or wishes**

- 0 I don't have any thoughts of killing myself
- 1 I have thoughts of killing myself, but I would not carry them out
- 2 I would like to kill myself
- 3 I would kill myself if I had the chance

**10. Crying**

- 0 I don't cry anymore than I used to
- 1 I cry more than I used to
- 2 I cry over every little thing
- 3 I feel like crying but I can't

**11. Agitation**

- 0 I am no more restless or wound up than usual
- 1 I feel more restless or wound up than usual
- 2 I am so restless or agitated that it's hard to stay so still
- 3 I am so restless or agitated that I have to keep moving or doing something

**12. Loss of interest**

- 0 I have not lost interest in other people or activities
- 1 I am less interested in other people or things than before
- 2 I have lost most of my interest in other people or things
- 3 it's hard to get interested in anything

**13. Indecisiveness**

- 0 I make decisions about as well as ever
- 1 I find it more difficult to make decisions than usual
- 2 I have much more greater difficulty in making decisions than I used to
- 3 I have trouble making any decisions

**14. Worthlessness**

- 0 I do not feel I am worthless
- 1 I don't consider myself as worthless and useful as I used to
- 2 I feel more worthless as compared to other people
- 3 I feel utterly worthless

### **15. Loss of Energy**

- 0 I have as much energy as ever
- 1 I have less energy than I used to
- 2 I don't have enough energy to do very much
- 3 I don't have enough energy to do anything

### **16. Changes in sleeping Patterns**

- 0 I have not experienced any changes in my sleeping pattern
- 1a I sleep somewhat more than usual
- 1b I sleep somewhat less than usual
- 2a I sleep a lot more than usual
- 2b I sleep a lot less than usual
- 3a I sleep most of the day
- 3b I wake up 1-2 hours early and can't get back to sleep

### **17. Irritability**

- 0 I am no more irritable than usual
- 1 I am more irritable than usual
- 2 I am much more irritable than usual
- 3 I am irritable all the time

### **18. Changes in Appetite**

- 0 I have not experienced any change in my appetite
- 1a My appetite is somewhat less than usual
- 1b My appetite is somewhat greater than usual
- 2a My appetite is much less than before
- 2b My appetite is much greater than usual
- 3a I have no appetite at all
- 3b I crave food all the time

**19. Concentration**

- 0 I can concentrate as well as ever
- 1 I can't concentrate as well as usual
- 2 It's hard to keep my mind on anything for very long
- 3 I find I can't concentrate on anything

**20. Tiredness**

- 0 I am no more tired or fatigued than usual
- 1 I get more tired or fatigued more easily than usual
- 2 I am too tired to do a lot of the things I used to do
- 3 I am too tired to do most of the things I used to do

**21. Loss of interest in sex**

- 0 I have not noticed any recent changes in my interest in sex
- 1 I am less interested in sex than I used to be
- 2 I am much less interested in sex now
- 3 I have lost interest in sex completely

### Appendix 3

#### Medical Screening Questionnaire

**Please read the following questions carefully and answer honestly. Fill in the required information and circle the response appropriate to you.**

1. Has a doctor ever said that you should only do physical activity recommended by a doctor? **Yes / No**
2. Do you have any known heart conditions? **Yes / No**
3. Is your doctor currently prescribing drugs for your blood pressure or heart condition?  
**Yes / No**
4. Are you currently taking any prescribed medication? **Yes / No**

**If so please specify** \_\_\_\_\_

5. Have you ever fainted during or after exercise? **Yes / No**
6. Have you ever been dizzy during or after exercise? **Yes / No**
7. Have you ever had chest pain during or after exercise? **Yes / No**
8. Do you have a bone or joint problem (for example, back, knee or hip) that could be worsened by a change in your physical activity? **Yes / No**
9. Have you any known family history of heart disease under age of 55? **Yes / No**
10. Do you smoke? **Yes / No**
11. Have you ever been told that you have?
  - A) High blood pressure **Yes / No**
  - B) Heart infection **Yes / No**
  - C) Heart murmur **Yes / No**

12. Do you know of any other reason why you should not do physical activity?

**If so please**

**specify** \_\_\_\_\_

13. How many times per week do you currently exercise? (*Please circle*)  
**0      1      2      3 or more**

## Appendix 4

### Physical Self-Description Questionnaire

This questionnaire asks you to describe yourself physically. Please read every sentence and decide your answer, there are 6 possible answers for each question – ‘true’, ‘false’, and 4 answers in between. Circle the number that best describes you.

False <b>1</b>	Mostly False <b>2</b>	More False than true <b>3</b>	More true than false <b>4</b>	Mostly true <b>5</b>	True <b>6</b>	
1. When I get sick I feel so bad that I cannot even get out of bed	1	2	3	4	5	6
2. I feel confident when doing coordinated movements	1	2	3	4	5	6
3. Several times a week I exercise or play hard enough to breathe hard (huff and puff)	1	2	3	4	5	6
4. I am too fat	1	2	3	4	5	6
5. Other people think I am good at sports	1	2	3	4	5	6
6. I am satisfied with the kind of person I am physically	1	2	3	4	5	6
7. I am attractive for my age	1	2	3	4	5	6
8. I am a physically strong person	1	2	3	4	5	6
9. I am quite good at bending, twisting and turning my body	1	2	3	4	5	6
10. I can run a long way without stopping	1	2	3	4	5	6
11. Overall, most things I do turn out well	1	2	3	4	5	6
12. I usually catch whatever illness is going around	1	2	3	4	5	6
13. Controlling movements of my body comes easily to me	1	2	3	4	5	6
14. I often do exercise/activities that make me breathe hard	1	2	3	4	5	6
15. My waist is too large	1	2	3	4	5	6

16. I am good at most sports	1	2	3	4	5	6
17. Physically, I am happy with myself	1	2	3	4	5	6
18. I have a nice looking face	1	2	3	4	5	6
19. I have a lot of power in my body	1	2	3	4	5	6
20. My body is flexible	1	2	3	4	5	6
21. I would do well in a test of physical endurance and stamina	1	2	3	4	5	6
22. I don't have much to be proud of	1	2	3	4	5	6
23. I am sick so often that I cannot do all the things I want	1	2	3	4	5	6
24. I am good at coordinated movements	1	2	3	4	5	6
25. I get exercise/activity 3-4 times a week that makes me huff and puff and lasts at least 30-mins	1	2	3	4	5	6
26. I have too much fat on my body	1	2	3	4	5	6
27. Most sports are easy for me	1	2	3	4	5	6
28. I feel good about the way I look and what I can do physically	1	2	3	4	5	6
29. I am better looking than most of my friends	1	2	3	4	5	6
30. I am stronger than most people my age	1	2	3	4	5	6
31. My body is stiff and inflexible	1	2	3	4	5	6
32. I could jog 5 kilometres without stopping	1	2	3	4	5	6
33. I feel that my life is not very useful	1	2	3	4	5	6
34. I hardly ever get sick or ill	1	2	3	4	5	6
35. I can perform movements smoothly in most activities	1	2	3	4	5	6
36. I do physically active things (like dancing) at least three times a week	1	2	3	4	5	6
37. I am overweight	1	2	3	4	5	6
38. I have good sports skills	1	2	3	4	5	6
39. Physically, I feel good about myself	1	2	3	4	5	6
40. I am ugly	1	2	3	4	5	6
41. I am weak and have no muscles	1	2	3	4	5	6

42. My body parts bend and move in most directions well	1	2	3	4	5	6
43. I think I could run a long way without getting tired	1	2	3	4	5	6
44. Overall, I am no good	1	2	3	4	5	6
45. I get sick a lot	1	2	3	4	5	6
46. I find my body handles coordinated movements easily	1	2	3	4	5	6
47. I do lots of sports, dance, gym and other physical activities	1	2	3	4	5	6
48. My stomach is too big	1	2	3	4	5	6
49. I am better at sports than most my friends	1	2	3	4	5	6
50. I feel good about who I am and what I can do physically	1	2	3	4	5	6
51. I am good looking	1	2	3	4	5	6
52. I would do well in a test of strength	1	2	3	4	5	6
53. I think I am flexible enough for most sports	1	2	3	4	5	6
54. I can be physically active for a long time without getting tired	1	2	3	4	5	6
55. Most things I do, I do well	1	2	3	4	5	6
56. When I get sick it takes a long time to get better	1	2	3	4	5	6
57. I am graceful and coordinated when I do sports/activities	1	2	3	4	5	6
58. I do sports, exercise, or other activities almost every day	1	2	3	4	5	6
59. Other people think that I am fat	1	2	3	4	5	6
60. I play sports well	1	2	3	4	5	6
61. I feel good about who I am physically	1	2	3	4	5	6
62. Nobody thinks that I am good looking	1	2	3	4	5	6
63. I am good at lifting heavy objects	1	2	3	4	5	6
64. I think I would perform well on a test measuring flexibility	1	2	3	4	5	6



65. I am good at endurance activities like running, aerobics, swimming or bicycling	1	2	3	4	5	6
66. Overall I have a lot to be proud of	1	2	3	4	5	6
67. I have to go to the doctor because of illness more than most people my age	1	2	3	4	5	6
68. Overall, I am a failure	1	2	3	4	5	6
69. I usually stay healthy even when my friends get sick	1	2	3	4	5	6
70. Nothing I do ever seems to turn out right	1	2	3	4	5	6

## Appendix 5

### Post-intervention Evaluation Questionnaire

On a scale of 0-10 how much do you think you will enjoy participating in this study?  
(Please circle, 10=the most)

0	1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	---	----

What did you enjoy most about taking part in the study?

What did you enjoy most about the online programme?  
(rate in order of preference, 1=most enjoyable)

Youtube clips

Quizzes

Personal Tasks

Discussion Forum

This study was aimed specifically at young men. Do you think that.....

1. Young men could easily relate to the content of the online programme?

Yes

No

Why?

2. The online programme taught you some useful skills that you can use in life?

Yes

No

Why?

Please indicate which weeks of the online programme you have completed:

Preparation

Stress management

Teamwork

Tactics

The Glasgow Handshake

Bouncing back from tough games

Coaches Point of View

In the Zone

Match Fitness

Back of the Net

## Appendix 6

### Qualitative Questionnaire

Please answer the following questions in one sentence.

1. How would you describe your life at the moment?

---

---

2. What do you think about sports and exercise?

---

---

3. Why do you think it is beneficial for people to exercise?

---

---

On a scale of 0-10 how much do you think (you will / are you / did you) enjoy participating in this study? (*Please circle*)

0	1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	---	----





**Are You....**

**Male aged 18-35 years**

and interested in participating in a

**Physical & Psychological  
Well-being study?**



**DCU School of Sports Science**

are conducting a study investigating  
the benefits of exercise on well-being

If you are not regularly physically  
active you could be eligible to take part

We are looking for males who are  
interested in participating in a  
10-week study aimed at using  
exercise and online programmes  
to enhance physical and psychological well-being



If you are interested phone  
Nadine **01 7008470**  
or text **086 7358899**  
before end of September

## Appendix 8

### Social Provisions Scale

This questionnaire consists of statements that ask you about your relationship with other people. Read each statement and circle the number which best describes your **current** relationships with friends, family members, co-workers, and so on. For example, if you feel a statement is VERY TRUE of your relationships with other people you would circle STRONGLY AGREE. Answer each statement.

	Strongly Disagree <b>1</b>	Disagree <b>2</b>	Agree <b>3</b>	Strongly Agree <b>4</b>
1. There are people I know will help me if I really need it	1	2	3	4
2. I do not have close relationships with other people	1	2	3	4
3. There is no one I can turn to in times of stress	1	2	3	4
4. There are people who call on me to help them	1	2	3	4
5. There are people who like the same social activities I do	1	2	3	4
6. Other people do not think I am good at what I do	1	2	3	4
7. I feel responsible for taking care of someone else	1	2	3	4
8. I am with a group of people who think the same way I do about things	1	2	3	4
9. I do not think that other people respect what I do	1	2	3	4
10. If something went wrong, no one would help me	1	2	3	4
11. I have close relationships that make me feel good	1	2	3	4
12. I have someone to talk to about decisions in my life	1	2	3	4
13. There are people who value my skills and abilities	1	2	3	4
14. There is no one who has the same concerns as me	1	2	3	4
15. There is no one who needs me to take care of them	1	2	3	4
16. I have a trustworthy person to turn to if I have problems	1	2	3	4
17. I feel a strong emotional tie with at least one other person	1	2	3	4



18. There is no one I can count on for help if I really need it	1	2	3	4
19. There is no one I feel comfortable talking about problems with	1	2	3	4
20. There are people who admire my talents and abilities	1	2	3	4
21. I do not have a feeling of closeness with anyone	1	2	3	4
22. There is no one who likes to do the things I do	1	2	3	4
23. There are people I can count on in an emergency	1	2	3	4
24. No one needs me to take care of them	1	2	3	4