Understanding physical activity among individuals receiving opioid substitution treatment – a mixed methods study

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Abstract

This thesis explores the physical activity (PA) practices and experiences of a group of drug users receiving opioid substitution treatment (OST). Opioid Substitution treatment is the most widely used form of treatment for individuals with opioid dependence. Existing research in this group (and drug users in general) has tended to focus on harmful behaviours, as opposed to their everyday lives. Additionally, a recent shift in UK drugs policy has places an increased emphasis on the wider aspects of recovery from drug use, including the improvement of health, well-being and re- integration into society. Despite the numerous benefits associated with PA, little research has explored PA among individuals receiving OST.

The use of a social-ecological approach to guide and understand the research findings was utilized, with both quantitative and qualitative data collected. Self-reported quantitative data was first collected on demographic information, PA participation, perceived benefits and barriers to PA and health-related quality of life from 100 participants. Objective PA data was also collected from a smaller sub-sample of participants through the use of pedometers. Secondly, semi-structured interviews were conducted with 30 participants, to gain further understanding of PA in this group, with the qualitative data analyzed using the Framework approach.

Both quantitative and qualitative findings indicate that much of this population is physically active, largely through walking as a form of active transport, with participant in structured sport and exercise occurring less frequently. However, nearly all participants reported previous participation in structured PA prior to drug use and an a desire to resume participation. The benefits of PA participation were unanimously recognized, with perceived barriers to participation highlighted at multiple levels of influence in line with the social-ecological approach used to theoretically underpin the study.

While many individuals receiving OST appear to be physically active through unstructured PA, increased participation in structured PA is often desired, yet prohibited through the presence of multiple barriers, some similar to the general

population and others specific to this group. Participation in structured PA may yield additional benefits beyond those gained from unstructured activity, contributing to the wider aspects of individuals' recovery from opioid dependence in line with current UK policy. However, strategies to increase participation may need to consider the multiple needs of this group in addressing barriers to participation.

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EBBS	Exercise Benefits/Barriers Scale
HBM	Health Belief Model
HIV	Human Immunodeficiency Virus
IQR	Interquartile Range
OST	Opioid Substitution Treatment
PA	Physical Activity
PPAQ	Paffenbarger Physical Activity Questionnaire
SCT	Social Cognitive Theory
SF-36	Short Form 36 Health Survey
SD	Standard Deviation
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
TTM	Transtheoretical Model
UK	United Kingdom
USA	United States of America
WHO	World Health Organization

Chapter 1

An introduction to opioid dependence and opioid substitution treatment

1.1 Chapter introduction

Opioid dependence is associated with a number of harms, both to the individual and wider society. Opioid substitution treatment (OST) has become established as the main treatment form for opioid dependence, primarily through two substances – methadone and buprenorphine. This chapter will outline the importance of treating opioid dependence and provide an overview of the evidence base on OST. Additionally, the position of OST within UK policy on recovery from drug use will also be presented.

1.2 Opioid use and dependence

Opioids are a group of substances that elicit an analgesic effect, by binding to opioid receptors within the central and peripheral nervous system. The broad use of the term opioid, includes both naturally occurring substances (e.g. opium and morphine), as well as semi-synthetic and synthetic derivatives (e.g. heroin and methadone respectively). Within medical treatment, opioids have a number of important functions, with their main purpose being to provide pain relief. However, given the euphoric nature of opioids, they are also associated with recreational use and misuse. The regular ongoing use of opioids can lead to 'tolerance', whereby the user begins to adapt to the presence of the drug and larger quantities are required to achieve the same effects, subsequently leading to 'dependence'.

Opioid dependence is not just the heavy use of opioids, but rather a complex health condition characterized by a cluster of cognitive, behavioural and physiological features (World Health Organization, 2009). According to the International Classification of Diseases, 10th edition (2010), opioid dependence is defined as the presence of three or more of the following features present at any one time in the preceding year: a strong desire or sense of compulsion to take

opioids; difficulties in controlling opioid use; a physiological withdrawal state; tolerance; progressive neglect of alternative pleasures or interests because of opioid use; and persisting with opioid use despite clear evidence of overtly harmful consequences. Repeated opioid use induces a series of neuroadaptions in within the brain that are involved in motivation, memory, behaviour control and disinhibition (World Health Organization, 2009). As such, an increased and long-lasting reward value is associated with the use of opioids and the environmental cues associated with use, and a decreased reward value associatied with natural reinforcers encountered in everyday life (Volkow and Li, 2004).

It can be difficult to estimate the number of people using illicit drugs and the amount that they consume. This is due to both unwillingness by some to admit to having violated the law by possessing illicit drugs such as heroin and the difficultly in reaching people who use illicit drugs. Household surveys are often used to collect drug use data and given the chaotic nature of heavy illicit drug use, which may be accompanied by a lack of permanent residence, this sub-group may missed altogether. Despite these difficulties, gathering data on the prevalence of illicit drug use is essential in informing policy and service provision. Based on a nationally representative sample of adults it was estimated that in 2011/12 there were 256,163 opioid users in England, with this number approaching 300,000 when individuals using both opioids and crack cocaine were included (Hay, Rael dos Santos and Worsley, 2014). Opioid abuse comprises a small amount of the total illicit drug use in the UK; disproportionately however, this abuse accounts for more than 80% of all drug overdose deaths and in 2012/13, 80% of individuals receiving treatment for their drug use were misusing opioids (National Drug Treatment Monitoring System, 2013).

1.3 Harms associated with opioid dependence

Although the prevalence of opioid dependence may be low in the context of the population, the burden to the individual and the wider community can be substantial (Mattick et al., 2014). Opioid dependence is as associated with a number adverse harms, which may occur both as a result of using the drug itself

and through the risky and chaotic lifestyle often accompanying opioid dependence.

One of the most prominent harms associated with opioid dependence is the exposure to blood borne viral infections, particularly hepatitis and the human immunodeficiency virus (HIV). A number of opioid dependent individuals will at some point in their life inject opioids, thus increasing the risk of exposure to blood borne viruses, through the sharing of contaminated needles, syringes and other equipment used to inject. In 2013-2014, 11,990 (17%) individuals entering treatment reported that they were currently injecting; and a further 17,548 (25%) individuals had previously injected (Public Health, England, 2014). It is estimated that half of people who inject drugs are infected with hepatitis C; one in 100 have HIV; and a third have a bacterial infection as a result of their injecting (Health Protection Agency, 2012). While this data refers to all injecting drug users, opioids are the most commonly injected type of drug and so will constitute a large proportion of these findings.

Dependent opioid users are at a greater risk of premature death, through the afore mentioned exposure to blood borne virus as well as through drug overdose, violence and suicide (Degenhardt et al., 2011). Opioid using populations have elevated rates of a number of risk factors associated with suicide including increased prevalence of psychiatric disorders, including depression and anxiety (Drake, Mueser and Brunette, 2007; Mills et al., 2007) and social isolation (Conner et al., 2006). Diminished quality of life as a result of unemployment, impaired relationships and financial and legal problems, as well as poor health are also all associated with opioid dependence (Neale, 2004)

In addition to health-related harms, opioid dependence is closely associated with criminal activity (Bennett, Holloway and Farrington, 2008). Opioid dependent users frequently engage in income generating crimes, particularly drug dealing and theft (Budd, Sharp and Mayhew, 2005; DeBeck et al., 2007). The cost of opioid dependence stretches beyond the individual and can result in both social and economic harms; with possible harms including reduced quality of life and psychological health of the families of opioid dependent individuals; as well as

the cost to the state of healthcare and the criminal justice system (Disley et al., 2013).

1.4 Treating opioid dependence – opioid substitution treatment

Opioid dependence is a complex health condition that often requires long-term care. The treatment of opioid dependence is important to reduce health, social and economic costs and improve the well-being of those affected (World Health Organization, 2010a). A variety of treatment options exist for opioid dependence in the UK, including pharmacological and psychosocial treatments, both within the community and residential facilities (National Institute for Health and Care Excellence, 2007). As no single treatment is effective for all individuals and the treatment aims for individuals with opioid dependence vary, diverse treatment options are required.

Opioid substitution treatment (also referred to as maintenance or replacement therapy) is the standard evidence-based treatment used for illicit opioid dependence in the UK. Opioid substitution treatment involves the prescription and administration of licit pharmaceutical opioids as 'substitutes' for illicit opioids (National Treatment Agency for Substance Misuse, 2013). The most widely prescribed form of OST is methadone, followed by buprenorphine; between 2007 and 2012 almost seven times more prescriptions were issued for methadone than buprenorphine (Marteau et al. 2015). Other less commonly used forms of OST include a combination of buprenorphine and naloxone and injectable diamorphine (pharmaceutical heroin) (National Treatment Agency for Substance Misuse, 2013). It was estimated that in in 2012, 165,000 opioid dependent individuals were receiving treatment for their drug use and of these approximately 150,000 were receiving a form of OST (National Treatment Agency for Substance Misuse, 2013).

The broad aim of OST is improve the quality of life of opioid dependent individuals and to reduce the potential harm of using illicit drugs, both for the individual and those affected by their drug use (Ford et al., 2011). Opioid substitution treatment seeks to initiate the process of stabilization and thereby

reduce the chaotic lifestyle and negative consequences associated with illicit opioid dependence (Dekel, Benbenishty and Amram, 2004). The two main ways in which OST is used are in the form of maintenance therapy, using the drug as an ongoing replacement to reduce and stop the use of illicit opioids; and for detoxification, where again OST is used as a replacement drug, with the dose reducing until all opioid use (licit and illicit) is stopped (Ford et al., 2011).

Research examining the efficacy of OST in terms of reducing illicit opioid use, has demonstrated its effectiveness through a range of outcomes related to the health and social consequences of illicit opioid dependence, including retention in treatment, illicit use of opioids, blood borne virus transmission, criminality and employment. A comprehensive review of the evidence for the effectiveness of the two most widely used forms of OST – methadone and buprenorphine – concluded that both drugs were effective in treating opioid dependence, based on meta-analyses of 31 systematic reviews and 27 Randomised Controlled Trials (National Institute for Health and Care Excellence, 2007).

Significant reductions in heroin use have been reported in numerous studies with various forms of OST (Gruber et al., 2008; Kinlock et al., 2009). A comprehensive systematic review of 31 studies, containing 5,430 participants, concluded that methadone and buprenorphine are more successful in reducing illicit opioid use and retaining individuals in treatment when compared to placebos (Mattick et al., 2014). As a result of reduced heroin use, OST has also been effective in reducing the harms associated with illicit opioid dependence. In comparison to untreated opioid dependent individuals, those receiving OST have significantly reduced mortality and morbidity rates, with each year in OST reducing the probability of death by 10% (Kimber et al., 2010). Additionally the reduced risk of blood borne viruses (Turner et al., 2011) reflects the reduced engagement in the chaotic and risky lifestyles of illicit opioid dependent individuals when receiving OST (Degenhardt, 2009). As part of initiating the process of stabilization and reduced chaotic lifestyle, there is also extensive data on the reduction in acquisitive crime associated with illicit opioid dependence, as well as increased rates of employment and housing (Dekel, Benbishty and Amram, 2004).

In terms of improvements in health, a review of studies of the quality of life among opioid dependent individuals reported mixed findings (de Maeyer, Vanderplasschen and Broekaert, 2010). In general individuals report low levels of quality of life and health-related quality of life at admission to OST, in line with the low levels of quality of life among opioid dependent individuals (de Maeyer, Vanderplasschen and Broekaert, 2010). Participation in OST has been found to be associated with increases in quality of life and health-related quality of life, especially during the first months of treatment, however longer-term (12 months, plus) effects are unclear (de Maeyer, Vanderplasschen and Broekaert, 2010). Additionally OST has been associated with a number of problems and side-effects including prejudice and discrimination (Earnshaw, Smith and Copenhaver, 2013) as well as excess sweating, reduced saliva leading to dental problems, constipation, nausea, vomiting, drowsiness and loss of libido (Schoofs et al., 2014).

1.5 Recovery from drug use and the UK drugs strategy

While there has been a long standing use of OST to treat illicit opioid dependence in the UK, there has also been a debate running alongside, between those who support its use and those who view the treatment form as replacing one addiction with another. In 2010 the UK government released a new national drug strategy entitled 'Reducing Demand, Restricting Supply, Supporting Recovery' (Home Office, 2010). This strategy represented a move away from previous directives which had largely been harm reduction focused, that is focused on preventing or reducing the harms associated with the use of drugs, rather than on the prevention of drug use itself (International Harm Reduction Association, 2010). The new strategy saw a shift towards a recovery-oriented approach.

The UK Drug Policy Commission (2008, p.6) defined the process of recovery as 'voluntarily sustained control over substance use which maximizes health and well-being and participation in the rights, roles and responsibilities of society'. Similarly, in the US the Betty Ford Institute (2007, p.222) provided a definition of recovery as 'a voluntarily maintained lifestyle characterized by sobriety, personal

health and citizenship'. Three key components of recovery highlighted in both these definitions involve well-being and quality of life, some measure of community engagement or citizenship and some measure of sobriety (UK Drug Policy Commission, 2008). In addition the view that recovery is a process or journey rather than a pre-determined end state is also widely accepted (National Treatment Agency for Substance Misuse, 2012). These aims of recovery are echoed in the three key principles of the 2010 drug strategy encompassing, well-being, citizenship, as well as freedom from dependence (Home Office, 2010).

Opioid substitution treatment was acknowledged as having played an important role in the treatment of illicit opioid dependence both through stabilizing drug use and supporting detoxification. However the strategy also criticized the often long-term and indefinite nature of maintenance prescribing and that 'for too many people currently on a substitute prescription, what should be the first step on the journey to recovery risks ending there' (Home Office, 2010). Following on from the new drug strategy an expert group convened to examine the evidence base for different forms of OST on behalf of the Department of Health (National Treatment Agency for Substance Misuse, 2012). Tasked with developing a clinical consensus and appropriate clinical protocols for OST to support long-term recovery and prevent 'unplanned drift into long-term maintenance' the final report from the group concluded that OST should continue to have 'an important and legitimate place within recovery-orientated systems of care' (National Treatment Agency for Substance Misuse, 2012). Although the value of OST with no time limits was emphasized, the group recommended a more rigorous and ambitious system of monitoring than had previously been in place, including the review and assessment of individuals receiving OST to check and stimulate their readiness to change and to utilize and develop their recovery capital (National Treatment Agency for Substance Misuse, 2012).

Researchers and clinicians have devised the construct of 'recovery capital' as a way of understanding how the recovery process might be facilitated. The 2010 drugs strategy defined recovery capital as 'the resources necessary to start and sustain recovery from drug and alcohol dependence' (Home Office, 2010).

There are four key components to recovery capital (Cloud and Granfield, 2009):

1. Social capital – the sum of resources an individual has as a result of their relationships with family, partners, children, friends and peers etc. and includes both support from and obligations to these groups.
2. Physical capital – tangible assets such as safe accommodation and finances that may increase recovery options
3. Human capital – includes skills, positive health, aspirations and hopes and personal resources that will enable an individual to succeed on a recovery journey
4. Cultural capital – includes the values beliefs and attitudes that are held by and individual and link to social conformity and the ability to fit into dominant social behaviours.

As such, in line with the new recovery-focused policy, treatment services were expected to bring improvements to the wider, relevant areas of individual's lives. With reference to individual's receiving OST, the expectation was also highlighted that they would engage in effective recovery activities, to ensure movement towards full (abstinence) recovery as quickly and appropriately as they were able to (National Treatment Agency for Substance Misuse, 2012). However as mentioned earlier, much of the research into OST has tended to focus on the role of OST in terms of retention in treatment, reduced drug use, the reduction of high-risk behaviours. Research into participation of individuals receiving OST in positive activities, such as the afore mentioned 'recovery activities' in their everyday lives is limited, as is research incorporating individuals' own perspectives in this area.

1.6 Chapter summary and the purpose of the thesis

This thesis will explore the role of physical activity (PA) in the everyday lives of individuals receiving OST for illicit opioid dependence.

Opioid substitution treatment is the main treatment form for illicit opioid dependence and the evidence suggests a number of benefits to the use of OST.

These benefits include a reduced risk of death by overdose, reduced risk of the transmission of blood borne viruses and reduced involvement in crime by individuals receiving OST. Despite these benefits, the use of OST has frequently been met with controversy in relation to its long-term, maintenance-based use. This debate was further emphasized in 2010 with a shift in UK drugs policy, towards a recovery where concerns were raised regarding the number of individuals 'parked' on OST and not moving towards abstinence from all drugs, including their OST. Additionally, as part of the increased focus on recovery, was the attention not just on the harmful behaviours related to drug use, but also the positive wider aspects of individuals' lives, including well-being and citizenship that could help contribute to sustained recovery.

Research into individuals receiving OST has tended to focus on the earlier mentioned harmful aspects of drug use in terms of treatment outcomes and less on the everyday life activities of this group. Physical activity is an activity that is associated with numerous health and well-being benefits, however limited research has been conducted in this population to explore the role of PA in individuals lives, including PA levels and experiences. The purpose of this study is to explore PA in individuals receiving OST, first by attempting to quantify PA levels and then further exploring attitudes and experiences to PA. The next chapter will explore the benefits associated with PA participation, as well as existing research relating to PA and illicit drug use.

Chapter 2

A summary of the literature on physical activity

2.1 Chapter introduction

Following on from the rationale provided in the previous chapter for exploring PA among individuals receiving OST, this chapter will consider the literature on PA. In providing an overview of PA, the benefits of participation, as well as levels of participation recommended for achieving these benefits will be provided. This will be followed by a summary of the literature pertaining to PA and drug use.

2.2 Defining physical activity and its sub-components

Before further exploring PA it is necessary to consider what is meant by the term. As defined by the World Health Organization (2014), PA is 'any bodily movement produced by skeletal muscles that requires energy expenditure'. As such, PA acts as a broad umbrella term encompassing many sub-categories of activity that are often used interchangeably to refer to being 'physically active', but have their own specific meanings.

The most frequently referred to sub-categories of PA are exercise and sport, which although similar, have several key differences which set them apart. Exercise is a type of PA that is 'planned, structured, repetitive and purposeful in the sense that the improvement or maintenance of physical fitness, physical performance or health are the primary objectives' (Caspersen, Powell and Christenson, 1985). Sport differs from exercise in that it involves structured competitive situations governed by rules (Department of Health, 2004). Some types of activity may fall into both of these categories, depending on the context in which they are undertaken. Other variations on the definitions of sport and exercise also exist, with the European Sports Charter (2001) taking a broader view of sport (also adopted by Sport England) to include all exercise and leisure-time PA: 'sport means all forms of active recreation which through casual or organized participation, aimed at expressing or improving physical fitness and mental well-

being, forming social relationships or obtaining results in competitions at all levels'.

As well as these structured forms of PA, further sub-categories of PA also include less structured, daily activities of active recreation and active living. Active recreation is generally considered to be an unstructured activity participated in during leisure time for a sense of enjoyment, while also benefiting individuals' physical, social and emotional well-being (Department of Health, 2004). Physical activities that occur as part of individuals' daily lives, such as household chores, gardening and transport can be grouped under the term active living (Edwards and Tsouros, 2006).

For the purpose of this study the term PA will be used to refer to all its sub-components, both structured and unstructured. Where specific types of PA require discussion, these will be referred to individually.

2.3 The benefits of physical activity

Participation in PA is associated with a range of physical, psychological, social, environmental and economic benefits and so plays an important role in the well-being of individuals, communities and society as a whole. Some of the key benefits are summarized below.

In terms of the physical health of individuals, evidence has demonstrated the positive impact on a number of bodily systems including cardiovascular, musculoskeletal, metabolic, endocrine and immune (Sport England, 2012). In relation to a number of chronic diseases including cardiovascular and heart, diabetes, some cancers, obesity and osteoporosis, PA has also been widely recognized as a means of prevention as well as treatment and rehabilitation (Department of Health, 2010). Furthermore PA has been shown to have a positive effect on mental health and psychological well-being (Department of Health, 2010). Some key benefits identified in the general population include decreased depression, decreased anxiety, stress reduction, enhanced mood and increased self-esteem (Department of Health, 2011). Physical activity can also reduce

feelings of isolation and loneliness, improve social and community networks and encourage connectedness (Mental Health Foundation, 2013).

Extending further beyond the individual the benefits of PA also include environmental and economic aspects. While not the focus of the this study, participation in forms of active transport such as walking and cycling in the place of car journeys can have a positive impact on the environment through reduced emissions and noise pollution (Larouche, 2012). Economically, the afore mentioned benefits to individual health result in savings nationally in terms of treating diseases linked to physical inactivity (UK Active, 2014). Sport and exercise may also contribute to the creation of employment as well as attracting tourism, benefiting both local communities and wider society. Also contributing to positive communities, PA may also contribute to reductions in anti-social behaviour and criminal activity (Nichols, 2007)

2.4 UK physical activity recommendations

Given the extent of evidence on the benefits of PA, there is both national and international interest in ensuring that as many people as possible participate in PA. In order to achieve the associated health and well-being benefits of PA, national guidelines or recommendations have been published on how much and what types of PA should be undertaken attain the afore mentioned benefits of participation.

The current PA recommendations for the UK were released in 2011 and were the first guidelines to be issued UK-wide by the Chief Medical Officers of England, Northern Ireland, Scotland and Wales (Department of Health, 2011). In addition, this was also the first time that specific guidelines had been produced for children under five years old (early years) and the first document produced in the UK to highlight sedentary behaviour and its role as an independent risk factor for ill health (Department of Health, 2011).

UK guidelines currently recommend that PA of at least moderate-intensity should be engaged in for a minimum of 150 minutes a week or alternatively for at least

75 minutes if the PA undertaken is of a vigorous intensity (Table 1) (Department of Health, 2011). These recommendations represent a shift from the previous guidelines, that at least 30 minutes of PA should be carried out on at least five days per week, with a move to focusing on total PA spread across the week. Additionally, the stipulation that PA to improve muscle strength should also be performed on at least two days of the week was also included in the 2011 PA guidelines, having been absent from previous recommendations. The further addition of a specific guideline related to time spent engaged in sedentary behaviour and not just active behaviour, emphasized the importance for all adults of minimizing extended periods of time spent being sedentary (Department of Health, 2011). These recommendations are in line with other international PA guidelines including the 2008 Physical Activity Guidelines for Americans (US Government, 2008) and the Global Recommendations on Physical Activity for Health (World Health Organization, 2010b).

Table 1. UK physical activity recommendations (Department of Health, 2011).

Type of physical activity	Recommendation
Moderate-intensity	150 minutes/week
Vigorous-intensity	75 minutes/week
Strength training	At least twice/week

2.5 Current levels of physical activity in the UK general population

In addition to being a source of information on recommended PA participation, national PA guidelines also act as a means by which to monitor PA participation, in groups of individuals or the population as a whole. Knowing which sections of the population are and are not meeting the recommended levels of PA is of importance in order to appropriately target strategies to increase participation. Given the wide-ranging benefits of an active population, ensuring PA participation is a key theme across a number of Government departments,

including Health, Culture, Media and Sport; Children, Schools and Families; and Transport.

The most recent population data in England estimates that 66% of men and 56% of women are meeting the current PA guidelines (Health and Social Care Information Centre, 2014). Data on PA levels prior to the revised 2011 guidelines reported even lower levels of participation, with just 40% of men and 28% of women meeting recommendations (Department of Health, 2011). In both of these publications on the general population, PA data was collected through self-report methods. While self-reporting is one of the quickest and cost-effective ways of collecting large amounts of PA data, it is subject to inaccuracies (as compared to objective measures), and in particular over-reporting (Prince et al., 2008). Thus, PA levels in the general population may actually be even lower than those estimates given.

In addition to differences in PA levels between men and women, there are also significant inequalities in PA participation in the UK in terms of a number of other sub-groups of the population. Those from minority ethnic backgrounds, older adults, individuals with a disability or chronic health problem and individuals with a low socio-economic status are less likely to be meeting PA recommendations (British Heart Foundation, 2012; Townsend et al., 2012).

2.6 Physical activity and drug use

Moving on from the general population and the well-known benefits of PA participation, the remainder of this chapter will present a summary of the existing literature on PA in drug using populations.

A search of the literature was carried out in Medline (Ovid), NOVA, PsycINFO, PubMed, Sport Discus and Web of Science. The following search terms were used: 'physical activity', 'sport', 'exercise', 'fitness', 'opioid', 'heroin', 'problem drug use', 'illicit drug use', 'drug use', 'substance use', 'substance misuse', 'methadone', 'opioid substitution treatment', 'opioid substitution therapy',

'methadone maintenance', 'buprenorphine', 'cannabis', 'crack cocaine' and 'addiction'.

Little research was found on PA in individuals receiving OST for illicit opioid dependence and this work was often part of a wider study involving other types of individuals, drug use and treatment forms. As such, literature will be presented on PA in relation to dependent drug users and not solely those in receipt of OST. Additionally, as the context of this study is in the exploration and understanding of PA in the lives of individuals receiving OST (who have already used and become dependent on illicit opioid drugs), existing literature on the role of PA in rehabilitation, treatment and recovery from drug use will be reviewed, rather than on the role of PA in the prevention of drug use, of which numerous studies exist. Research relating to other forms of substance use, namely alcohol and tobacco/nicotine were considered outside the scope of this review and so not included. A summary table of studies included can be found in Appendix A.

The following summary will be presented in two parts – the first, examining the role of PA as part of a drug treatment programme; and the second, the role of PA in the everyday lives of drug dependent individuals.

2.6.1 Physical activity as part of a treatment programme for drug use

Ten studies were found exploring PA as part of a treatment programme for drug users. Of these, nine were intervention based and one was a review of the literature.

One of the earliest found studies to examine the role of PA as part of a drug treatment programme involved the participation in a community softball team as part of a residential rehabilitation programme (Burling et al., 1992). Of the 34 male participants in the study, those who were involved in the community softball team were retained in treatment for longer than those in a control group and not part of the softball team. As well as an increased likelihood of completing treatment, those who participated in the softball group also reported significantly higher rates of abstinence compared to the control group, three months later. In a

more recent publication reviewing the literature on the effect of PA in treating drug use, Zschucke, Gaudlitz and Ströhle (2013) highlighted a number of limitations of the early work in the area by Burling et al. (1992). In particular, the unequal group sizes and contact time between those participating in softball and those in the control group, as well as a lack of randomization into each condition, make it difficult to conclude categorically that the any differences between the groups were due to the inclusion of PA. Additionally the choice of softball as the PA type implemented in the study was criticized, due to its North American cultural specificity, resulting in a reduced applicability and generalizability of the findings outside of this region.

Evidence of the potential positive impact of PA as part of a drug treatment programme was demonstrated in a later study of 20 offenders, this time enrolled in a non-residential treatment programme (Williams, 2003). Participants volunteered to participate in bi-weekly strength training sessions and so similarly to the softball programme of Burling et al. (1992) there was a lack of randomization into the PA group, which may have involved self-selection bias of those who already enjoyed PA opting in to the condition. Nearly all of those who undertook the strength training session felt that the inclusion of PA as part of the programme had been an important tool in preventing relapse. However, psychoeducational material on relapse prevention was also delivered alongside the strength training sessions, which may have also played a role in preventing relapse for participants.

Strength training was again utilized as part of a programme aimed at changing addictive behaviour through PA, however this time it was used alongside cycling (Roessler, 2010). For a period of two to six months, 20 problem drug users trained for two hours a day, three times a week. At the end of the study fewer participants reported having worries about social problems and drug intake had also generally decreased, with all participants reporting that drugs no longer played a dominant role in their time prioritization. A further positive outcome of the study was that the fitness levels of participants increased by an average of 10% during the training programme. In qualitative data collected as part of the same study, participants also reported having a better sense of body, improved fitness, reduced

suffering from withdrawal, higher energy levels, sleeping better at night and a new found self-confidence. One year after training had ceased 50% of participants reported that they were still physically active, however all participants were less active than during the afore mentioned training programme and many described that they missed participating in the structured forms of sport and exercise. Of the 20 participants who took part, five were drug free at the one-year follow up, 10 had reduced their drug use and four individuals reported not having changed their drug use since the study. Interestingly, Roessler (2010) also provided information on 15 participants who had to be excluded from the study due to lack of participation. The reasons given for this lack of particaption were largely health based (e.g. due to pain or fatigue) or related to lack of time/other commitments (e.g. childcare or relationship problems).

Echoing the findings of improved rates of abstinence and reduced relapse following a treatment programme incorporating PA are the findings of Brown et al., (2010). At the end of a 12-week programme consisting of both supervised and individual aerobic training sessions, 66% of participants reported being abstinent. Participants who attended at least three quarters of the PA sessions also reported significantly lower relapse rates after 12 weeks as well as significantly increased fitness. Similarly to the work of Williams (2003), the study also included a cognitive behavioural training component, which may have influenced the study outcomes. Further positive findings on the role of PA relating to future abstinence were found in an examination of the use of exercise-related activities in contingency management treatment for drug use, in addition to standard outpatient drug use treatment (Weinstock, Barry and Petry, 2008). Completing more physical activities was positively associated with the longest duration of abstinence. Those participants who completed an exercise-related activity reported significantly longer durations of abstinence compared to participants who did not complete any exercise-related activities, even after accounting for other relevant factors.

In an all female study, 43 offenders with a history of polysubstance abuse or dependence, volunteered to be part of a residential drug treatment programme that included a wellness component incorporating PA and other health-related lifestyle

modification training (Peterson and Johnstone, 1995). After a minimum of nine months engaged in the programme, assessment of participants found significant improvements in physical fitness in the group, concurrent with other literature already mentioned (Brown et al., 2010; Roessler, 2010). Qualitative data gathered from the 43 women upon exiting the treatment programme suggested that participants had also experienced significant enhancements in a number of areas pertaining to psychological well-being, including self-esteem; health awareness and concerns; healthy lifestyle adoption; and relapse prevention skills.

In the largest study to date on the role of PA in treatment for drug dependence, 86 male heroin users took part Qigoing – an traditional Chinese health practice, consisting of meditation, relaxation, guided imagery, mind-body integration and breathing exercises (Li, Chen and Mo, 2002). Undertaken by individuals in China undergoing a detoxification programme, those who participated in Qigoing reported less symptoms of anxiety and fewer incidences of reported withdrawals symptoms than those who did not participate. While the cultural specificity of Qigoing may limit its appropriateness in other contexts and populations, research by Shaffer, LaSalvia and Stein (1997) examined the use of a similar, yet more widely known form of PA – yoga. Notably the work of Shaffer, LaSalvia and Stein (1997) is the only intervention to focus explicitly on individuals receiving OST (specifically methadone) for illicit opioid dependence. In an exploration of the use of yoga on treatment outcomes of 61 individuals receiving methadone, participants were randomly assigned to either weekly group psychotherapy or group yoga and followed for a period of six months. Findings indicated that group yoga was just as effective as the more traditional form of psychodynamic group therapy in contributing to a treatment programme that resulted in significantly reduced drug use and criminal activity.

In the most recent study exploring the use of PA as an intervention in drug dependent individuals, Benyon et al. (2013) conducted a feasibility and acceptability study on the use of an exercise referral scheme for drug users aged over 40 years. Participants were asked to attend a gym twice a week for eight weeks, and were provided with a bus pass, sports clothing and a two-month gym membership, in recognition that cost can be a barrier to PA in lower

socioeconomic groups. Twenty-two gym inductions were arranged; with17 inductions completed and 14 individuals starting exercise. Gym attendance fluctuated, with individuals missing weeks then re-engaging. At the end of the eight weeks five participants attended the gym. In general participants enjoyed exercising, but would have welcomed more support and wider range of PA to participate in as opposed to just the use of a gym. Those participants who completed baseline and follow-up assessments did report feeling fitter and non-significant improvements in several measures of physical fitness were observed. Additionally, the number of weeks of gym attendance was significantly associated with a positive change in metabolic equivalents (a measure of fitness). The authors concluded that while it is possible to recruit older drug users into a gym-based exercise referral scheme and that the observed changes in health benefits do suggest the potential benefit of such a programme, multiple health and social challenges may affect regular participation in this population.

In addition to the nine intervention-based studies found, one review of the literature on PA within substance abuse treatment was also found. Williams and Strean (2004) presented a review of the literature indicating the rationale for the potential benefits of PA to recovery from addiction. The article provided an overview of common variables contributing to addiction and a summary of the relationship between PA and improvements to many of these variables. The authors suggested that while more research is needed, the numerous benefits of PA can be an important adjunct to substance abuse treatment. The Transtheoretical model was highlighted as means of matching readiness to engage in PA. This review not only included drug use, but also alcohol and nicotine addiction, as well as PA as a means of prevention – topics of relevance, but beyond the focus of this study.

While research into the role of PA as part of or alongside drug treatment as part of an intervention programme has yielded positive findings in relation to health and fitness, as well as reduced and sustained reduced drug use, methodological limitations mean that such findings should be interpreted cautiously. In particular, studies were often small in sample size, with most having been conducted outside of the UK affecting the generalizability of their findings. The self-selection of

participants into PA conditions in many of the studies may have also resulted in biased samples. Other forms of treatment were offered alongside PA in several instances, making it difficult to infer that changes in outcome measures observed were solely due to the inclusion of PA. Finally, the evidence base largely consisted of quantitative work, which while providing key initial information, lacked the greater depth and understanding of experiences that can be gained through the addition of qualitative data.

2.6.2 Physical activity participation in the everyday lives of drug users

Nine studies were found exploring PA as part of drug users' everyday lives. Of these, eight were found in the initial survey of the literature prior to undertaking this research project. One study (Caviness et al., 2013) was subsequently conducted involving methadone maintained individuals and was added to the review.

In order to inform the use of PA as part of a targeted intervention, it is important to explore how active drug dependent individuals are in their everyday lives. As part of a wider, national longitudinal study in Scotland, Neale, Bloor and McKeganey (2007) collected survey data on how 606 heroin users entering treatment liked to spend their spare time. Over half (56%) of the sample reported at least one leisure interest at entry to treatment with nearly 90% of participants reporting at least one leisure interest 33 months later. Participation in forms of PA, including sport and exercise, were the most common types of leisure interests reported. These findings are in agreement with Drumm et al. (2005) in the examination of the self-care strategies of 28 street drug users. The qualitative findings of this study indicated that drug users in this sample were interested in PA as part their as part of self-care efforts, with participants reporting participation in a range of activities including walking, basketball and rollerblading. Similar findings were found in a US population of drug users, whose health care experiences included regular participation in PA (Duterte et al., 2001). As well as participation, strategies to increase PA were also identified as a key theme of self-care among a group of 77 chronic and injecting drug users in an Australian population (Holt and Treloar, 2012). Physical activity – both structured

and unstructured – was reported as a useful mental health self-care strategy and a way to lift mood, relax, improve self-esteem and provide a distraction from negative experiences or the temptation of using illicit drugs. Despite these benefits, a lack of motivation was seen as a limiting factor to participation, particularly among those individuals suffering from depression.

In a study specifically exploring the role of sport and exercise in the lives of 45 intravenous drug users, Powers, Woody and Sachs (1999) found a high level of interest in these activities. Sixty-four percent of participants reported that sport and/or exercise played a role in their lives and similarly to general population data on PA participation, more men that women found sport and/or exercise to be of importance (78% versus 31% respectively). Participants offered a range of reasons as to why they felt sport was important to them, including: keeping healthy, providing a release for daily stresses and tensions, an opportunity for socialization and keeping their minds off drugs. As well as participation in in sport and/or exercise 72% of participants described themselves as sports fans, which echoes the findings of Neale, Bloor and McKeganey (2007) in that the hobbies of heroin users in treatment also include watching sport.

In a more recent study Neale, Nettleton and Pickering (2012) further explored the views of PA of drug users in a qualitative study of 40 participants. Part of a larger study on recovery from illicit opioid use, participants were either starting a new episode of drug treatment or had recently stopped using illicit opioids. Of note in terms of this research project, within the sample were 10 individuals who were starting a new prescription of OST, in the form of either methadone or buprenorphine. Consistent with earlier mentioned research, participants reported a keen interest in PA and as well as regular participation. Improvements in physical fitness, as well as general physiological and psychological health were cited as benefits experienced from participation. Opportunities for social contact and a means of weight management were also viewed as positive reasons for being physically active. More specific benefits of PA participation related to drug use included helping with recovery by taking their minds of drugs and reducing boredom. The main form of PA reported was walking, however participation in other structured forms of sport and exercise was also described. As participants

expressed a desire to be more active than they currently, perceived barriers to participation were also explored and included individual, social and structural factors with heavy drug use being the clearest barrier to participation.

While several studies have identified that drug dependent individuals do participate in PA, few studies have attempted to quantify these PA levels. Fischer et al. (2012) found that prior to entry into prison, 21 of 25 class A drug users reported having been either moderately or highly physically active. Collected through the use of self-report surveys, participants reported walking a mean distance of 4.67 miles a day, roughly equating to just over three hours time spent walking and in excess of UK PA guidelines (Department of Health, 2011). The total mean energy expenditure through PA in the week prior to entry into prison for the sample was 5,007 kcal/week. Findings indicated that the majority of PA was obtained through walking, with only eight participants reporting participating in more structured forms of sport and exercise. When tested all 15 participants had a good or excellent aerobic capacity, indicating high levels of fitness.

Similarly, high levels of everyday PA were found by Smit et al. (2006) in an American study of HIV-negative and HIV-positive injecting drug users. Again, data was collected through the use of a self-report questionnaire and total mean energy expenditure through PA ranged from 2,899 kcal/week to 3,149 kcal/week with the majority of activity accumulated through light intensity activities. Participation in structured exercise and strength training were low, with individuals participating on average once a week (HIV-negative) and less than once a week (HIV-positive).

While not available when this research project was designed, subsequently one study has explored PA among individuals receiving methadone (Caviness et al., 2013) highlighting the relevance of this topic. In a US study of 305 individuals enrolled in a smoking cessation intervention trial, PA participation and perceived barriers and benefits to participation were explored through the use of self-report surveys. As well as being enrolled in a smoking cessation trial, stringent inclusion criteria included having undertaken at least four weeks of methadone treatment; the absence of a number of psychological health problems, including bipolar and

schizophrenia; the absence of a number of physical health problems, including heart problems and recent seizures. Findings indicated that this group were less active than the general population, with only 38% meeting weekly PA recommendations and a quarter of participants reporting no moderate or vigorous PA. These findings appear to show lower levels of PA than found in drug-using populations, not explicitly consisting of individuals receiving OST. Despite this lack of PA, the benefits to participation were well-known, with those meeting PA guidelines significantly more likely to endorse relapse prevention as a benefit of PA. Few barriers to PA were identified, however of those that were, lack of motivation was the most widely cited. While providing preliminary data on a large number of individuals, the restricted inclusion criteria in this study may have influenced the generalizability of the findings. Additionally not all individuals receiving OST receive methadone, however this was the only form of OST explored.

The limited number of studies exploring PA as part of the everyday lives of drug users appears to indicate that this group are interested and do participate in PA, however the only study to have explicitly explored OST yielded lower findings. Physical activities undertaken by drug users on a daily basis seem to be largely unstructured (walking), although participation in sport and exercise is not entirely absent. This differentiation in participation in activity types is of interest given that the earlier presented research on PA interventions as part of drug treatment programmes focused on participation in sport and exercise. The perceived benefits of participation in PA were also highlighted in a number of studies, however less research has examined the perceived barriers to participation, which may be important for further understanding PA participation in this population and informing future PA strategies.

2.6.3 Synthesis of the physical activity and drug use literature

Nineteen studies were found relating to the role of PA in the lives of drug users; either as part of a treatment programme for drug use or on PA within individuals' everyday lives. Nine studies consisted of PA interventions; nine studies explored everyday PA; and one review of the literature was found.

There is suggestive evidence that PA may be of benefit as part of a drug treatment programme. Frequently reported positive outcomes of treatment conditions including PA included: increased rates of treatment completion (Burling et al., 1992); relapse prevention (Williams, 2003; Brown et al., 2010; Weinstock, Barry and Petry, 2008); reduced drug use (Roessler, 2010; Brown et al., 2010; Shaffer, LaSalvia and Stein, 1997); decreased anxiety (Roessler, 2010; Li, Chen and Mo, 2002); improved health and fitness (Brown et al., 2010; Roessler, 2010; Peterson and Johnstone, 1995; Benyon et al., 2013); improved self-esteem (Roessler, 2010); fewer withdrawal symptoms (Li, Chen and Mo, 2002); and reduced criminal activity (Shaffer, LaSalvia and Stein, 1997).

Outside of participation in a PA intervention, the benefits of participating in PA as part of individuals' everyday lives were also recognized, both in relation to health and social benefits and more specific drug use issues, including: distraction from using drugs (Holt and Treloar, 2012; Powers, Woody and Sachs, 1999; Neale, Nettleton and Pickering, 2013); physical and mental health care (Holt and Treloar, 2012; Powers, Woody and Sachs, 1999; Neale, Nettleton and Pickering, 2013); opportunities for socialization (Powers, Woody and Sachs, 1999; Neale, Nettleton and Pickering, 2013); and relapse prevention (Caviness et al., 2013)

Outside of structured interventions, the literature suggests that drug-using individuals are interested in PA (Neale, Bloor and McKeganey, 2007; Drumm et al., 2005; Powers, Woody and Sachs, 1999; Neale, Nettleton and Pickering, 2013). However, only three studies had sought to quantify drug users' PA levels through the use of qualitative surveys. High levels of walking and low levels of structured sport and exercise were found by Fischer et al. (2012) and Smit et al. (2006). In a study of methadone prescribed drug users, Caviness et al. (2013) found low total levels of PA, when compared to the general population.

Again, only a small number of studies explored the possible barriers that drug using individuals might experience to PA participation. In both intervention based and everyday PA studies, barriers at individual, social and structural levels were reported with particular emphasis on heavy drug use (Neale, Nettleton and

Pickering, 2013); motivation (Caviness et al., 2013); health and social challenges (Roessler, 2010; Benyon et al., 2013).

The clearest theme within the current literature on PA and drug use are the potential benefits of incorporating PA into drug users' lives. These benefits may be similar to those cited within the general population, relating to improved health and well-being, as well as more specific issues relating to drug use, such as reduced substance use and aiding with relapse prevention. However, it is important to be tentative when interpreting the current literature and to consider the findings in the context of their limitations.

The majority of studies found were conducted outside of the UK and largely in the USA. This has implications when considering the context of treatment services within different countries as well as the PA culture in different locations. Cultural differences were reflected in some of the PA types used in the intervention-based studies e.g. softball and Qigong, which may have limited transferability. As well as the various different types of PA used, there was also variation among studies as to the duration of interventions, the frequency of treatments and who delivered the PA treatment (if specified at all), making it difficult to generalize findings. The small sample sizes of many studies also has an impact upon the generalizability of the data.

It is also worth noting that in the intervention-based studies, PA often did not occur in isolation. Relapse prevention material was also provided by Williams (2003) and cognitive behavioural training by Brown et al. (2010). Findings relating to the everyday PA of drug using individuals was often part of a broader study exploring self-care and health, and as such while the findings provided are useful for future research considerations, they require further detail and exploration.

As mentioned in terms of the inclusion criteria for this summary of the literature, few studies exist explicitly consider PA among individuals receiving OST. As such, the reviewed literature (and often within studies) contains a wide variety of individuals using different substances, for varying periods of time and engaged in

different forms of treatment. All of these factors may play a role in an individual's willingness and ability to be able to initiate and maintain PA and should be kept in mind going forward.

The current literature warrants further research within the area of drug use and PA, and OST is an area that has been particularly understudied. The need for quantification of PA levels is apparent, as is the requirement for further exploration into the possible barriers to participation, if as suggested by the limited research, participation levels in structured sport and exercise in particular may be low.

2.7 Chapter summary

Physical activity encompasses a broad range of activities, ranging from structured forms of sport and exercise to unstructured, naturally occurring activities of daily living. Numerous physical, psychological, social, environmental and economic benefits are associated with regular PA participation, however a large amount of the adult general population in the UK are not physically active enough to achieve these associated health and well-being benefits of PA.

In terms of information on drug use and PA, little research exists, but can be divided into intervention-based studies and explorations of everyday PA. While study findings suggest numerous benefits of PA to this population, some of which are similar to those of the general population, as well as additional drug-related benefits, many methodological limitations exist. The evidence base for data on the everyday PA of drug users provides little quantification of the PA levels of drug users; however research does emphasize the interest in PA in this population and the perceived benefits of participation, however limited research has explored factors influencing PA in this group, such as barriers and motivators.

Chapter 3

Theoretical approaches to understanding physical activity

3.1 Chapter introduction

This chapter will provide an overview of the most widely used theoretical approaches for understanding PA behaviour in PA research. Following a rationale for the use of theory to understand PA, a brief description of the following key theories will be presented: the Health Belief Model, the Theory of Reasoned Action/Planned Behaviour, Social Cognitive Theory and the Transtheoretical Model. Subsequently, the theoretical approach to be used for framing and understanding this study of PA in individuals receiving OST – a social-ecological approach – will be discussed.

3.2 Defining theory

Theory can be defined as 'a set of interrelated concepts, definitions and propositions that present a systematic view of events or situations by specifying relations among variables, in order to explain and predict the events or situations' (Glanz, Rimer and Viswanath, 2008). As they are abstract by nature, theories are not content or topic specific, instead they provide a framework for describing and understanding various phenomena, and as put by Glanz, Rimer and Viswanath (2008), 'come alive' when filled with topics, goals and problems. Theories are often divided into two main types – explanatory and change. Explanatory theories help to describe and identify the nature of a particular problem, as well as why that problem exists, guiding the search for modifiable factors of behaviour. In contrast, change theories inform the development and implementation of intervention strategies, highlighting how concepts can be translated into messages and strategies for changing behaviour (Glanz, Rimer and Viswanath, 2008). Many theories have the potential to be used in both an explanatory and change capacity.

3.3 Theoretical approaches to understanding physical activity

In describing PA as 'complex behavioural phenomenon', Biddle and Mutrie (2007) advised that in order to understand participation in all forms of PA, good theoretical research is required. A large number of influences (including determinants, correlates, moderators and mediators) have been identified through existing research to influence PA participation. Theories can provide useful frameworks for exploring and further understanding these influences in various populations, thus enabling the design of more effective interventions (e.g. strategies, programmes or polices) to impact upon PA (Culos-Reed, Brawley and Gvurcsik, 2001)

Traditionally psychosocial theories, focusing on cognitive, affective and social influences on PA, have dominated the theoretical literature regarding PA behaviour; the most popular of which include the Health Belief Model (Becker, 1974), the Theory of Planned Behaviour (Azjen, 1991), the Transtheoretical Model (Prochaska and DiClemente, 1983) and Social Cognitive Theory (Bandura, 1986) (Sallis and Owen, 1999; Biddle and Nigg, 2000). Increasingly the role of the wider environment (including the physical environment and policy factors) has been recognized as an important determinant of PA, along with the interrelated nature of various factors influencing PA, rather than them acting in isolation. Accordingly, theoretical approaches such as social-ecological approaches (Sallis, Owen and Fisher, 2008; Stokols, 1992), which take into account multiple levels of influence (e.g. individual, social and environmental) on PA, have gained increasing support in their use in explaining behaviour.

The following sections of this chapter will consider the previously mentioned key psychosocial theories in the literature on PA behaviour, followed by the multi-level approach to be used in this study.

3.3.1 The Health Belief Model

One of the earliest theories to be applied to PA behaviour, the Health Belief Model (HBM) (Becker, 1974), was initially developed in relation to public health

issues. With the original intention of aiding the understanding of why individuals did or did not use preventative services offered by public health departments in the 1950's, the model has subsequently evolved to address newer concerns in prevention and detection as well as lifestyle behaviours (Glanz, Rimer and Viswanath, 2008). The HBM attempts to explain and predict behaviour by focusing on attitudes and beliefs. When applied to PA, the model can help explain the likelihood of an individual engaging in PA based on their perceived risk of inactivity (e.g. increased risk of disease) versus their perceptions of the benefits of engaging in PA outweighing these risks. These perceptions then subsequently influence an individual's readiness to take action and engage in PA (Glanz, Rimer and Viswanath, 2008). The six key concepts of the HBM as outlined by Glanz, Marcus-Lewis and Rimer (1997) are: (1) perceived susceptibility (of developing a negative health condition); (2) perceived severity (the significance of having said negative health condition); (3) perceived benefits (of undertaking a behaviour that could decrease the risk of the negative health condition); (4) perceived barriers (to undertaking the preventative behaviour); (5) self-efficacy (confidence in one's ability to overcome perceived barriers and that the behaviour will result in a positive outcome); and (6) cues to action (the readiness of the individual to take action).

The role of individual values and beliefs have been shown to have a noteable impact on PA engagement and adherence rates, however as mentioned earlier, increasingly the influence of wider factors on PA has also been recognized. As a psychological model the HBM does not take into consideration environmental factors (such as safety and access to facilities) that may influence behaviour and social influences (such as social norms and peer pressure) that have been demonstrated to affect an individual's decisions regarding PA behaviour (Van Holle et al., 2012; Ball et al., 2010). Additionally the HBM is limited by its tendency to treat changes in health behaviour as discrete events, rather than a process or sequence. Given that PA is a complex and ongoing behaviour, as opposed to the isolated illness-avoidance behaviours for which the model was originally designed to explore, e.g. attendance at a clinic, its applicability for use in explaining PA may be restricted.

3.3.2 The Theories of Reasoned Action and Planned Behaviour

The primary goal of the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) is to understand and thus predict social behaviours. The theory posits that the most important determinant of behaviour is intention, which is determined by (1) an individual's attitude and (2) the influence of social factors. Attitudes towards behaviour are formed from the beliefs surrounding the consequences of that behaviour (e.g. the health benefits of PA), weighed against the value of that consequence (e.g. the value of long term health). This aspect of the TRA is in agreement with the afore mentioned HBM, however the TRA goes beyond individual factors, also considering social influences in the form of social norms and the expectations of others.

In 1988, the newer Theory of Planned Behaviour (TPB) (Azjen, 1988) was added to the TRA to address several limitations of the original model. In particular the TPB included an additional construct – perceived behavioural control – to take into account behaviour that is not under conscious control. Perceived behavioural control is seen to be determined by a combination of two influences: (1) self-efficacy and (2) perceived control (the extent to which the behavioural performance is down to the individual). Azjen (1988) theorized that the greater perceived control an individual has over a behaviour, such as PA, the greater the amount of effort that would be applied to performing it.

Similar to the HBM, physical environmental influences are not included in the TPB. Additionally individual factors, such as personality and demographic variables (e.g. sex, age and socioeconomic status) are also omitted, which have been shown to influence PA behaviour (Barnes and Schoenborn, 2003). Additionally the TPB assumes that perceived behavioural control predicts actual behaviour, which is not always the case, as found in a large cohort of 887 adults, with half of those reporting positive intentions failing to initiate behaviour, thus highlighting the wider nature of factors which influence the translation of intention into PA behaviour (Rhodes, Plotnikoff and Courneya, 2008).

3.3.3 Social Cognitive Theory

The third widely used theory in PA research is Social Cognitive Theory (SCT) (Bandura, 1986). Developed from Social Learning Theory (Bandura, 1977), SCT posits that behavioural, personal and environmental factors are reciprocal, interacting determinants that are influential in determining behaviour and behaviour change. The term 'reciprocal determinism' is used to describe the reciprocal nature of behavioural (knowledge and skills), personal (internal thoughts and feelings about a behaviour e.g. self-efficacy and outcome expectations) and environmental (perceptions of, and the actual physical and social environments) factors that influence each other, as well as behaviour.

Two kinds of expectations are central to SCT, the first being outcome expectations. Outcome expectations are beliefs about whether a given behaviour is likely to lead to certain outcomes and is similar to the attitude construct in the TRA. Three aspects of outcome expectations have been described by Bandura (2004): (1) the anticipation of gains and losses, both personal and material; (2) the perception of social responses to behaviour change; and (3) the appraisal of how behaviour change sits with wider personal values. The other key aspect of SCT is self-efficacy. Self-efficacy is believed to influence an individual's outcome expectations, their view of the environment and the goals that they set for themselves. Individuals with high efficacy expectations are believed to be more likely to predict desirable outcomes from changing their behaviour and to see obstacles as surmountable, through the development of new skills and increased effort. Reflecting the reciprocal nature of the constructs comprising the SCT, it is indicated that reductions in another construct e.g. environmental barriers, will like lead to increased efficacy beliefs.

In terms of PA behaviour, self-efficacy is viewed by SCT as the leading determinant of consistent, health-promoting levels of PA (Bandura, 1997). However this has resulted in criticism towards the model, as despite the inclusion of social and environmental influences, the emphasis sits largely with self-efficacy. Little research exists utilizing SCT in its entirety within the PA domain and of the research that has, the findings have been inconclusive as to the ability

of the model as a whole to predict PA behaviour, as highlighted by White, Woiocicki and McAuley (2012) in a large scale study of over 300 adults which only found partial support for the use of the model in explaining PA behaviour.

3.3.4 The Transtheoretical Model

The psychosocial models discussed above – the HBM, the TRA, the TPB and SCT – have many overlapping elements. When applied to PA, these models hypothesise that a change in PA behaviour is more likely when the perceived benefits of participating in PA outweigh the perceived costs; when becoming more physically active will lead to social approval, not disapproval; when increasing PA is consistent with broader life goals and will lead to self-satisfaction; when the participating in PA is within personal control and there are few barriers to participation; and if the opportunities for PA are high (Foster et al., 2005).

The Transtheoretical Model (TTM) (DiClemente et al. 1991; Prochaska and DiClemente, 1983) – the fourth model to be presented in this chapter – differs from the theoretical approaches already mentioned, in that is a stage-based model. While using similar concepts to the afore mentioned theories, stage models organize these concepts differently, focusing on the notion that behaviour change involves the movement through a sequence of discrete and distinct stages. Different influencing factors on behaviour are believed to be important at each different stage of behaviour, thus also requiring different, targeted strategies, to facilitate behaviour change.

The TTM is a multi-dimensional theoretical model widely adopted to explain how individuals change various problem behaviours. Originating from research into negative addictive behaviours such as smoking, the TTM was used to explore how self-changers made successful changes without professional intervention. The TTM comprises four dimensions which all contribute to explain the processes involved in the various stages of behaviour change; these four dimensions are: (1) the stages of change,; (2) the processes of change; (3) self-efficacy/temptation and (4) decisional balance.

The stages of change dimension of the TTM addresses an aspect of behaviour change ignored by many other theories – that change is a process, which occurs over time. In the TTM, behaviour change is viewed as occurring through the progression of five stages. Progression through these stages can occur in both a linear and non-linear fashion, with individuals often recycling through stages before permanent behaviour change is achieved. The five stages as outlined by DiClemente et al. (1991) are:

1. Pre-contemplation, in which health behaviour change is not being considered (in the next six months)
2. Contemplation, in which health behaviour change is considered (in the next six months)
3. Preparation, in which an individual is planning for behaviour change (generally within the next month)
4. Action, involving the initial modification of adopting new habits (for at least six months)
5. Maintenance, the ongoing sustainment of the adopted behaviour (over six months and chances to return to old behaviour are few).

While the stages of change are useful in explaining when changes take place, the second dimension of the TTM – processes of change – helps to explain how these changes occur. The following 10 cognitive and behavioural processes need to be successfully implemented in order for an in individual to progress through the stages of change: consciousness raising, dramatic relief, environmental reevaluation, self-reevaluation, social liberation, reinforcement management, helping relationships, counterconditioning, stimulus control and self-liberation.

Also incorporated into the TTM are aspects of self-efficacy and decisional balance. Used to monitor an individual's progress through the stages of change, both have been shown to change in a predictable pattern across the five stages. In the initial precontemplation and contemplation stages of the model, individuals' temptation to engage in problem behaviour is greater than their self-efficacy to abstain. However, this shifts as individuals move from preparation to action, with

feelings of self-efficacy increasing and those related to negative temptations decreasing (Glanz, Rimer and Viswanath, 2008). Decisional balance, that is the pros and cons of behaviour change, also shifts as individuals progress through the stages of change. During the precontempation stage, the pros in favour of behaviour change are outweighed by the relative cons for change, in favour of maintaining existing behaviour. However as an individual moves through the stages, the decisional balance is tipped so that the pros of changing behaviour now outweigh the cons – an important component of preventing behaviour relapse (Glanz, Rimer and Viswanath, 2008).

Aside from the original use of the TTM as applied to smoking behaviour, the model has been widely used in an attempt to understand and explain PA behaviour. In particular the TTM has been utilized in stage-matching interventions (Spencer et al., 2006). In terms of PA and drug use research, Williams (2003) successfully used the stages of change dimension of the TTM to predict which individuals would benefit from a drug treatment programme including an exercise component. Of the 20 offenders who participated in the study, those who completed the programme tended to be further along in their readiness to engage in exercise than those who subsequently dropped out.

As a theoretical model the TTM is useful in aiding understanding of how PA is initiated, adopted and sustained. In particular, the model has advanced understanding on how to target and recruit different populations, depending on their readiness to change, with stage-matching having been shown to have a positive affect on retention rates in PA programmes (Pravessis, Maddison and Bradling, 2004). Despite this support for the use of the TTM in relation to PA behaviour, a number of anomalies have been identified resulting in a call for more standardized constructs (Marshall and Biddle, 2001), and the inclusion of more specific detail relating to different PA types e.g. being in the contemplation stage for a structured sporting activity, yet in the action stage for an unstructured activity such as walking (Miilunpalo et al., 2000). Additionally concerns have been raised over ability of the TTM to incorporate wider social, economic and environmental influences on behaviours such as PA (Taylor et al., 2006).

3.4 Social-ecological approaches

A universal criticism of the psychosocial theories outlined above is their emphasis on individual behaviour and lack of attention towards sociocultural and physical environmental influences. Social-ecological approaches on the other hand support the notion of multiple levels of influence on behaviour, including demographic, interpersonal, interpersonal and environmental and policy-related factors and their interplay – based on the perspective that behaviour does not occur in isolation.

Rather than consisting of just one model, a number of iterations of social-ecological approaches have been developed, providing comprehensive frameworks for understanding the multiple and interacting factors which influence behaviour. Additionally, due to the multi-level focus of these approaches their potential for guiding behaviour interventions has also been highlighted (Hamre et al., 2006). Sallis, Owen and Fisher (2008) posited that there are four key principles to social-ecological approaches:

1. There are multiple influences on specific health behaviours including factors at the intrapersonal, interpersonal, organizational, community and public policy levels.
2. Influences on behaviours interact across these different levels in a reciprocal nature, influencing and being influenced by each other.
3. Social-ecological models should be behaviour specific, identifying the most relevant potential influences at each level.
4. Multiple level interventions are most effective at changing behaviour.

Given the broad nature of social-ecological approaches, other theories can also be incorporated that focus on various levels of influence, providing a comprehensive framework for integrating multiple theories (Sallis, Owen and Fisher, 2008).

3.4.1 The Historical background of social-ecological approaches

One of the earliest influences in shaping current social-ecological perspectives was Bronfenbrenner's (1979) Ecological Systems Theory. Developed with the aim of understanding human development, Ecological Systems Theory specifies five systems of influence – the microsystem, mesosystem, exosystem, macrosystem and chronosystem – which are reflective of an individual's development. The microsystem is the level closest to the individual and the one within which they have direct contact (e.g. with family and friends). This level is viewed as the most influential level of the theory. Next is the mesosytem, which consists of the interactions between different parts of an individual's microsystem, influencing each other as well as having an indirect impact on the behaviour of the individual. Thirdly, the exosystem involves links between a social setting in which the individual does not have an active role, but still impacts upon them. The macrosystem encompasses the cultural environment in which an individual lives; with the chronosystem including environmental events and also extending to include transitions over time.

The use of social-ecological perspectives in informing public health issues has built upon the early work of Ecological Systems Theory as well synthesizing information from other disciplines. McLeroy et al. (1988) are frequently cited as one of the first pieces of work to specifically apply a social-ecological perspective to public health, in the form of the Ecological Model for Health Promotion. Developed as a means of understanding the role of human behaviour in chronic diseases, behaviour is viewed as being determined by the following five levels of influences: (1) intrapersonal factors (e.g. psychological and biological factors and developmental history); (2) interpersonal processes and primary groups (e.g. social networks and support systems including family and friends); (3) institutional factors (e.g. social institutions such as schools and workplaces); (4) community factors (e.g. relationships among organizations, institutions and informal networks); and (5) public policy (e.g. local, regional and national laws and policies). Other variations of social-ecological approaches have been suggested by Stokols (1992, 1996), with an increased emphasis on the role of the physical environment when encouraging or discouraging health behaviours, a

factor not specifically addressed in the earlier approaches of Bronfenbrenner (1979) and McLeroy et al. (1988).

3.4.2 Social-ecological approaches to understanding physical activity

As highlighted earlier in this thesis, numerous benefits are associated with participation in PA and as such there is a great deal of interest in understanding the reasons why some individuals and populations do/do not participate. While research has historically focused on the individual and social factors influencing PA behaviour, increasingly the role of the wider physical environment and policy context have also been recognized as impacting on PA participation, as well as the notion that multiple factors are likely to be influencing behaviour at any one time. In a review of the literature, Giles-Corti and Donovan (2002) compared the ability of psychological, social and physical environment variables to explain PA. Each category of variables was significantly related to PA, providing support for the principle of multi-level influences. The strongest associations were found for individual variables and the weakest for variables of the physical environment.

Based on the Ecological System's Theory, Spence and Lee (2003) developed a model of the environment to explore the environmental influences on PA, suggesting influences at four levels: (1) the microsystem, (2) the mesosystem, (3) the exosystem and (4) the macrosystem. Additionally, biological processes, higher-level mediators, physical ecology and the highlighting of direct and indirect influences within the environment are viewed as important considerations influencing behaviour. Thus this model suggests that PA behaviour is influenced by the interplay between the environmental setting and biological and psychological factors (Spence and Lee, 2003).

Sallis, Owen and Fisher (2008) also proposed the use of a multi-level approach based on existing social-ecological theories, for use in understanding four domains of active living: (1) active transport, (2) occupational activities, (3) household activities and (4) active recreation. At the centre of the theory, intrapersonal variables include demographic, biological and psychological factors. Moving outwards, individuals' perceptions of the environment are distinguished

from more objective aspects of the environment, as are the settings in which PA may occur; and specific environmental influences are also considered for each different type of activity. Finally, the influence of the political environment is also highlighted, again with reference to different influences on different activity types.

Given the limited research into PA in the everyday lives of drug users, it is not surprising that no research has been conducted integrating a social-ecological approach in this population, however existing research does point towards the multi-level influences on PA in this group. In an exploration of the views of a sample of heroin users towards PA, Neale, Nettleton and Pickering (2012) found barriers to PA were reported at individual, social and environmental levels. Notable barriers included drug use, poor health, lack of motivation, lack of self-efficacy, financial restraints, family responsibilities and lack of exercise/sporting facilities. Additionally, in a feasibility study on exercise referral in older drug users, barriers to participation were also reported at individual, social and physical environmental levels, with barriers including poor health, lack of motivation, family responsibilities and a dislike for the environmental setting of PA (Benyon et al., 2013). These studies highlight the appropriateness of using a multi-level approach, such as a social-ecological approach, in order to fully capture and understand as much as possible on the multiple factors influencing PA in a sample of individuals receiving OST.

While social-ecological approaches have not been used to explore PA in drug using populations, research has been conducted with a number of other groups, including minority and understudied populations including African American women (Fleury and Lee, 2006), overweight and obese adults (Blanchard et al., 2005), adolescent girls (Elder et al., 2007) and Indigenous populations (Nelson, Abbott and Macdonald, 2010). All of these studies cited lack of existing research in these populations as one reason for utilizing a social-ecological approach. Fleury and Lee (2006) suggested that because of their broad nature and yet inclusion of specific levels of influence, social-ecological approaches provide useful frameworks for understanding PA in populations where existing research is limited.

What all social ecological approaches have in common is their acknowledgement that it takes a combination of both individual level and wider level factors to influence behaviour, including PA behaviour. However, Sallis, Owen and Fisher (2008) noted that the wider level influences on behaviour have often been conceptualized in different ways, by different authors, using different approaches. This emphasizes the notion of social-ecological approaches as broad frameworks from which guide to research and interventions, as opposed to rigid to structures. In this study, the social-ecological approach as conceptualized by Stokols (1996), will be used to consider the various levels of influence relating to PA behaviour, through the following four categories: (1) individual (e.g. attitudes, beliefs, perceived barriers and motivation); (2) social (e.g. social networks and support; and cultural norms) environmental; (3) physical (e.g. availability and access to facilities, weather, community design and safety) environmental; and (4) policy (e.g. funding and initiatives).

As a distinct advantage of social-ecological approaches in comparison to just psychological, social or environmental-focused models alone, is the broad nature of factors considered to be influencing behaviour, this has also led to criticism of such approaches. These criticisms have been leveled the lack of information on how the broader levels of influence operate/how influences interact across levels and so may result in a lack of guidance on how to improve behaviour in terms of interventions. However these limitations are less relevant in this study whereby the use of a social-ecological approach allows for the identification of opportunities to promote PA participation by recognizing the multiple factors that influence individuals receiving OST PA behaviour.

3.5 Chapter summary

Physical activity and the factors influencing participation are complex. Theories provide frameworks for understanding the numerous factors that influence participation – both positively and negatively. Four of the predominant theories in PA research were presented whilst highlighting their limitations due to a focus on the individual, with little consideration for the wider aspects of an individual's

environment. Increasingly multi-level approaches to understanding PA are being used to take into account the social, physical and policy factors that influence behaviour and as such the fifth theoretical approach presented – a social-ecological approach – will be used as a framework in this study, for guiding the exploration of, as well explaining the findings relating to PA among individuals receiving OST.

Chapter 4

Methods

4.1 Chapter introduction

A mixed methods approach was used in this study in order to answer the research aims. This chapter will seek to provide a brief description of mixed methods research, followed by a rationale for the application of this approach in this study. The methods used in the data collection and analysis of the two phases of this study (quantitative followed by qualitative) will also be presented.

4.2 Defining mixed methods research

Tashakkori and Creswell (2007, p.4) defined mixed methods research as:

"Research in which the investigator collects and analyses data, integrates the findings and draws inferences using both qualitative and quantitative approaches or methods in a single study or program of inquiry".

The central element of this, and other definitions of mixed methods research, is the mixing of qualitative and quantitative approaches within a single study. In recent years, the combined use of quantitative and qualitative elements to answer complex research questions has gained increasing popularity (Heyvaert, Mawes and Onghena, 2011).

The case for the use of mixed methods research is made on the grounds that the combination of quantitative and qualitative approaches provides a better understanding of research problems than either approach alone. Historically, the argument for mixed methods research has been the presence of the strengths of both quantitative and qualitative research offsetting the weaknesses of the other method (Creswell, 2007). Other advantages to the use of mixed methods include the ability to answer questions that could not be answered by using either approach alone and the provision of more comprehensive evidence for studying a

research problem, with a greater variety of tools for data collection available for use (Creswell, 2007).

4.3 Mixed methods research and the paradigms debate

The mixed methods approach to research has emerged during the past two decades, joining stand-alone quantitative and qualitative methods and earning the title of the 'third research community' (Teddlie and Tashakkori, 2009); however its use has not been without controversy. One of the most prominent debates relating to the use of mixed methods, stems from the notion that quantitative and qualitative methods hail from widely differing research paradigms, and that to combine them in a single study is illogical on philosophical grounds (Giddings, 2006)

A paradigm can be defined as a set of interrelated assumptions about the social world, which provides a philosophical and conceptual framework for the organized study of that world (Filstead, 1979). That is, paradigms are a way of framing what we know, what we can know and how we can know it. Quantitative researchers most often work from the positivist or post-positivist paradigms. Qualitative researchers work mostly from the constructivist or interpretivist paradigms.

At one end of the debate are 'purists' who assert that paradigms and methods should not be mixed. Another school of thought is identified as the 'situationalists' who contend that certain methods can be used in specific situations. In direct opposition to the purists are the pragmatists who argue against a false dichotomy between the qualitative and quantitative paradigms and advocate for the use of both approaches. Proponents of mixed methods research have been linked to those whom identify with the pragmatic paradigm. The pragmatism paradigm advocates the use of all approaches in understanding a research problem, placing the research problem at the centre of the discussion (Creswell et al., 2003).

4.4 Combining qualitative and quantitative approaches

A critical aspect of good mixed methods research, is that it requires more than simply the use of a qualitative approach at one point in study and then a quantitative approach at another point. The process must be dynamic, involving decisions on the priority of each method (Creswell and Plano Clark, 2007; Greene, 2008). According to Creswell (2003) various mixed methods research designs exist and these can be classified according to the implementation of the qualitative and quantitative elements, in terms of the sequence of methods, the priority given to each approach and the stage of the study at which the qualitative and quantitative components are integrated. The importance of integrating qualitative and quantitative data in a purposeful and meaningful way to maximize the knowledge generated is a key aspect of mixed methods research (Tashakkori and Creswell, 2007). Without this integration, the knowledge gained is seen to be no greater than that from a qualitative study and a quantitative study undertaken independently, rather than achieving a whole greater than the sum of the parts (Barbour, 1999).

A wide range of approaches to combining qualitative and quantitative elements of mixed methods research exist. Tashakkori and Teddlie (2003) identified around 40 mixed methods research designs in the literature, of which the six most frequently used designs included three concurrent approaches (where both the qualitative and quantitative strands are implemented during a single phase of the research study) and three sequential approaches (where the qualitative and quantitative strands are implemented in two distinct phases, with the collection and analysis of one of one type of data occurring after the other). In addition, mixed methods designs can be classified as multiphase combination timing (where multiple phases including concurrent and/or sequential are implemented over the duration of the research study) (Creswell and Plano Clark, 2011). This study will undertake a sequential explanatory design, incorporating two phases of data collection conducted in a quantitative and then qualitative sequence.

4.5 A sequential explanatory approach to mixed methods research

A sequential explanatory approach to mixed methods research consists of two distinct phases, quantitative followed by qualitative (Creswell et al., 2003). Quantitative data is first collected and analysed to provide a general understanding of the research problem and then the second, qualitative phase of the study involves the collection and analysis of data to explain and further expand upon the initial quantitative findings (Teddle and Tashakkori, 2009). The quantitative and qualitative methods are mixed at the intermediate stage between the two phases of research, where quantitative findings may be selected for further qualitative explanation as well as being used to inform the design and subject of the qualitative data collection. Further mixing then occurs following the collection and analysis of the qualitative data, whereby the findings from both the quantitative and qualitative phases are synthesized to provide a more comprehensive picture of the research problem. Dominance may be given to either the quantitative or qualitative phase, or equal priority given to both phases (Ivankova, Creswell and Stick, 2006).

The rationale for taking a sequential explanatory approach to a research problem is that quantitative data provide a general understanding of the research problem, whereby the qualitative data refine and explain the quantitative findings by exploring participants' views in more depth (Teddle and Tashakkori, 2009; Creswell, 2003). A mixed methods sequential explanatory approach was chosen in this study to gain a fuller understanding of PA participation among individuals with OST. This allowed for the quantifying of PA behaviour and factors associated with PA that had not been previously quantified in a UK population of individuals receiving OST and then further explore and expand upon these findings through qualitative data collection.

The remainder of this chapter will outline the methods undertaken in each phase of this study. The reporting of essential information for the quantitative and qualitative phases was guided by the STROBE and COREQ checklists respectively (von Elm et al., 2008; Tong et al., 2007)

4.6 Quantitative phase

4.6.1 Overview

The first phase of this study utilized quantitative methods. A cross-sectional observational research design was employed to gather information relating to the PA patterns of individuals receiving OST. Self-report questionnaires (focused on demographic, PA behaviour, perceived barriers and benefits to PA and health-related quality of life) as well as one direct measure of PA (pedometer data) were used to collect quantitative data in relation to the following aims:

Primary objectives:

1. To describe the physical activity levels of individuals receiving OST
2. To describe the health-related quality of life of individuals receiving OST
3. To describe the perceived barriers and benefits to physical activity participation in individuals receiving OST
4. To validate self-reported physical activity in a sub-sample of individuals receiving OST through pedometer data

Secondary objectives:

1. To compare physical activity levels within individuals receiving OST
2. To explore the relationship between physical activity level and health-related quality of life in individuals receiving OST
3. To explore the relationship between physical activity level and perceived barriers and benefits to physical activity participation in individuals receiving OST
4. To assess the feasibility and acceptability of the use of pedometers to measure physical activity in a sub-sample of individuals receiving OST

4.6.2 Sampling

A convenience sample of 100 participants took part in this stage of the study completing four self-report questionnaires. Participants were recruited from two locations in Southern England, with 50 participants recruited from City A and 50 participants recruited from City B. Twenty-six of the 100 participants also took part in a smaller feasibility study involving the collection of pedometer data. Convenience sampling is a form of non-probability sampling whereby participants who are most accessible (e.g. in terms of location, time and effort) are recruited (Ritchie and Lewis, 2011). Facility-based sampling is a type of convenience sampling often used to study high risk/hard to reach populations. It involves the recruitment of participants from a variety of facilities frequented by members of the target population. Prisons have been used to sample populations involved in illegal activities such as illicit drug use as well as drug treatment centres and needle exchanges for accessing injecting drug users (Magnani et al., 2005). In this study participants were primarily recruited through pharmacies – a location that individuals receiving OST attend on a daily/weekly basis. Seven pharmacies were used as recruitment sites in City A and five pharmacies in City B. In addition a smaller number of participants were recruited through snowball sampling – another commonly used method of recruitment for individuals from hard to reach/hidden populations. Snowball sampling involves the identification of an initial number of members of a population – in this case obtained through pharmacies – from whom the desired data are gathered and who then serve to recruit other members of the population (Ritchie and Lewis, 2011).

The main drawback of non-probability sampling is sampling bias in that the sample obtained is not representative of larger population from which it was drawn (Ritchie and Lewis, 2011). For example, participants recruited through snowball sampling are often influenced by the choice of 'initial seeds', as well as being biased towards more cooperative and accessible subjects who are part of larger social networks (Ritchie and Lewis, 2011). Despite this disadvantage of non-probability sampling can be useful in formative research such as is the case in this study with almost no research on PA among individuals receiving OST.

The inclusion criteria for participants to participate in the study was threefold: that they were receiving a form of OST for illicit opioid dependence; that they were 18 years old or over; and that they were English speaking. Participants were deemed to be excludable from participation if they did not meet these conditions and additionally if they were not able to consent to participation (e.g. due to intoxication as assessed by pharmacy staff).

4.6.3 Quantitative data collection

Initial written information about the study was posted to potential pharmacies and followed up either in person by the researcher or via telephone. Once a pharmacy had expressed interest in participating in the study an introductory meeting took place outlining the aims of the study, the recruitment procedures and data collection methods. Upon agreement by each pharmacy to aid participant recruitment into the study project information was disseminated among all members of pharmacy staff.

The initial approach to potential participants informing them of the research study was made by pharmacy staff, both verbally and through the use of the study information sheet (Appendix B). Once an individual had expressed interest in participating in the study, further information was then provided by the researcher, who with the permission of each pharmacy spent time at each location to be on hand should a potential participant come forward. In order to respect the privacy of individuals attending each pharmacy to collect their OST, the researcher was positioned away from the pharmacy counter. This also served to avoid any situation whereby an individual might feel pressurized into participating in the study. For those who were interested in participating it was emphasized that participation or non-participation would not in any way affect any support or treatment that the individual was receiving and the anonymous nature of the research was also explained. Each participant was given time to consider their participation and once a clear interest was expressed in participating, arrangements were made to arrange for a convenient time at which to administer the four surveys for data collection.

All surveys were administered by the researcher face-to-face and took place in a community setting such as a café or public park/outside space. The researcher went through the study information sheet again with each participant and participants were asked to sign the study consent form (Appendix C) prior to taking part. The time taken to complete all four surveys ranged from 30 – 60 minutes and all questions were answered by all participants. Upon the completion of the surveys participants were debriefed on the research process, explaining what would happen to their data and emphasizing the anonymous and confidential use of the data and given the opportunity to ask any questions about the research process. All participants were reimbursed through £15 in supermarket vouchers as thanks for their time given participating in the study.

Prior to undertaking data collection, potential surveys to be used were piloted with two service users attending a drug treatment service. This piloting helped inform the selection of surveys to be used in the study, given the limited existing research in this population. Key issues mentioned during the piloting included the length of time required to complete the surveys and the potential relevance of some items to participants lives e.g. some physical activity surveys included large sections on work-related PA, which may not be relevant for many in this population.

4.6.4 Demographic survey

A demographic survey (Appendix D) was used to outline the biographic and socio-demographic details of participants. Adapted from the Drug Outcome Research in Scotland study (McKeganey et al., 2006; Neale, 2004) – a national study providing a wide-ranging evaluation of the main treatment services available to drug users in Scotland – the following variables were obtained:

- Age; sex; and ethnic background
- Current prescription drugs – all prescription drugs currently being taken, including, but not limited to participants' OST
- Drug treatment history – other forms of treatment relating to drug use currently or previously received

- Living situation – where and with whom the participant was living with
- Educational attainment – age at which the participant left school and their highest qualification attained
- Employment status
- Financial status – including being in receipt of any state benefits and the presence of any financial problems, such as debts
- Sleep pattern – quality of current sleep routine
- Food intake – number of meals and snacks eaten on the previous day
- Illicit drug use – non-prescribed drug use in the previous 3 and 90 days
- Main drug – the drug which was used most frequently or had caused the most problems
- Alcohol use – in the previous 3 and 90 days
- Injecting behaviour – in the previous three days and at all in their lifetime
- Social networks – marital status; number of children and whether they were living with the participant; and the number of close friends the participant felt they had
- Prison stays – any time spent in prison, including remands and sentences; and the date and duration of their last prison stay

4.6.5 Self-reported physical activity

A modified Paffenbarger Physical Activity Questionnaire (Paffenbarger, Wing and Hyde, 1978) (Appendix E) was used to assess current levels of self-reported PA. The questionnaire has been validated as a tool to assess planned weekly and lifestyle-associated PA (Pereira et al., 1997). The three major components of the PPAQ are stairs climbed, walking, and any other sports, exercise or active recreational activities participated in. As the PPAQ was developed in the US the measurement of units for walking was presented in blocks. This was replaced in the current study by miles (12 blocks = 1 mile), in line with other UK research using the PPAQ (Fischer et al., 2012). Participants were asked to report their PA for the previous week and if that week was unusual, a typical, recent week. Participants were asked to quantify how many flights of stairs they climbed on an average day and how many miles they walked on an average day. In addition they

were asked to list any sports, exercise or other recreational activities that they had participated in, giving the number of times and duration for which they had participated.

The PPAQ also allows for the calculation of energy expended through PA for the previous week. This is done through the use of the scoring system devised for the questionnaire and described by Paffenbarger, Wing and Hyde (1978). In summary, kilocalorie scores for blocks (in this case miles) and flights of stairs are computed as follows: 1 block = 8 kcal (1 mile = 96 kcal); 1 flight of stairs = 4 kcal. Reported sports and recreational activities are coded into three levels of intensity according to the Paffenbarger Questionnaire coding scheme and values are assigned by the Paffenbarger coding system as follows: low intensity activities are assigned 5 kcal/min, medium intensity activities are assigned 7.5 kcal/min and heavy intensity activities are assigned 10 kcal/min. Total estimated kilocalories per week are obtained by the following formula: (flights of stairs/day × 7 day/ week × 4 kcal/flight) + (miles/day × 7 days/week × 96 kcal/mile) + for each activity reported (activity intensity kcal/min × min/episode × episodes/week). One limitation of the PPAQ is that the kilocalorie values assigned to each activity type are derived from a 68kg male and there is no correction factor for gender or body weight and so the calculation of energy expenditure through PA is the same for all individuals regardless or body weight.

One of the reasons the PPAQ was selected for this study due to its short-length – important due to the number of other surveys to be completed. In addition when two ex-drug users who were members of a service user group were consulted the PPAQ was favoured against a number of other questions including the International Physical Activity Questionnaire (Craig et al., 2003) and the Global Physical Activity Questionnaire (Armstrong and Bull, 2006) for its relevance to the population being studied as the other questionnaires contained long sections on PA in the workplace which may not be relevant for large portions of this population. Additionally, the PPAQ has been used in two other studies involving drug users – class A drug users entering prison (Fischer et al., 2012) and a cohort of injecting drug users (Smit et al., 2006), providing sources of data with which to compare.

4.6.6 Perceived benefits and barriers to physical activity

Perceived benefits and barriers to PA were measured using the Exercise Benefits/Barriers Scale (EBBS) (Sechrist, Walker and Pender, 1987) (Appendix F). The EBBS is a 43-item questionnaire scored on a four-point Likert-type scale with possible responses ranging from four (strongly agree) to one (strongly disagree). Total scores for the instrument range from 43-172, with higher scores reflecting a more positive view of PA. In addition the two parts of the scale (benefits and barriers) can be used separately. When used independently the benefits scale has a possible score range of 29-116, with a higher score reflecting a greater perception of benefits to participating in PA. Alone, the barriers scale has a possible score range of 14-56 and is reverse scored, wither a lower score indicating a greater perception of barriers to PA.

The benefits component of the EBBS consists of 29 items categorized into five subscales: (1) life enhancement, (2) physical performance, (3) psychological outlook, (4) social interaction and (5) preventative health. The barrier component includes 14 items categorized into four subscales: (1) exercise milieu, (2) time expenditure, (3) physical exertion and (4) family discouragement. The reported internal consistency for the benefits and barriers scales in the original study of 605 healthy adults aged 18-88 years old was 0.95 and 0.87 respectively, with a measure of 0.95 for the total scale. Additionally, the test re-test reliability was 0.89 for the benefits subscale and 0.77 for the barriers subscale. The EBBS has not been used in any drug using populations, however it has demonstrated good reliability and validity in student, adult and older adult populations (Ortabag et al., 2010; Sechrist, Walker and Pender, 1987; Victor, 2012), including non-exercising women (Ansari and Lovell et al., 2009) and an Iranian population (Akbari Kamrani et al., 2014).

The EBBS was chosen for use in this study due to its successful use in a number of different adult populations. The questionnaire was also straightforward to complete – an important concern given the number of other surveys to be completed by participants. Additionally, as the EBBS measures physical, physiological and social benefits and as well as several types of barriers to

participation in PA such as environmental, physical and socio-cultural, this consideration of various levels of influence fits with the social ecological approach used to frame this study and so provides a base from which to further explore factors influencing PA participation in the qualitative phase of the study.

4.6.7 Health-related quality of life

Self-reported health-related quality of life was measured using the Short Form (36) Health Survey version two (SF-36) (Appendix G). The SF-36 has been widely used in clinical practice and research, health police evaluations and general population surveys. Designed to give information on general health and well-being the SF-36 also allows for the calculation of summary scores for physical and mental components of the scale. The SF-36 is comprised 36 items grouped into eight subscales: (1) physical functioning, (2) role-physical, (3) bodily pain, (4) general health, (5) vitality, (6) social functioning, (7) role-emotional and (8) mental health. Each item has a Likert-type structure and individuals are asked to answer based on how they have felt during the previous four weeks. Raw scores are then transformed on to a scale from 0 (worth possible health state) to 100 (best possible health state. The SF-36 has been used in a wide range of populations, including a large scale study of Scottish drug users (Neale, 2004), heroin users on entry to OST in the form of methadone (Ryan and White, 2006) and heroin users before, six and twelve months into OST (Habrat et al., 2002).

4.6.8 Pedometer measured physical activity – a feasibility inquiry

In addition to measuring PA through the self-report measure of the PPAQ, a smaller sub-sample of 26 individuals from the 100 original participants participated in feasibility study to measure PA through the use of a pedometer. In line with the objectives outlined earlier in this chapter, the function of this feasibility study was twofold; to serve as a means of providing some data on concurrent validity with the PPAQ and to assess the feasibility of using pedometers in this population, through adherence to the pedometer protocol.

Physical activity is a complex and often hard to measure behaviour, with self-report surveys as already used in this study the most widely utilized tool of measurement. While cost-effective, self-report surveys are limited in that response bias may occur whereby participants report behaviour that they perceive to be desirable, rather than accurate e.g. higher levels of PA (Sallis and Saelens, 2000) The reliance on recalling PA from memory can also be problematic, with self-report methods tending to overestimate PA levels (Schlicht, Ebner-Priemer and Kanning, 2014). Pedometers have been shown to offer a good solution for low-cost, objective monitoring of PA and additionally as behaviour modification tools in PA interventions (Pillay et al., 2014).

Participants each wore a pedometer (Omron HJ-104) for a period of seven days to record their daily step count. The Omron HJ-104 pedometer has been used in a number of other research populations including women (Lofgren et al., 2004) and sedentary adults (Baker, Mutrie and Lowry, 2008). Each pedometer was calibrated to individual participant's stride length according to the manufacturers instructions (stride length was estimated based on the amount of ground in 10 strides). The Omron HJ-104 pedometer has a seven-day memory function, meaning that participants were not required to record the number of steps taken each day. Participants were asked to wear a pedometer during waking hours other than when in water e.g. bathing or swimming. Participants were provided with a log sheet (Appendix H) and asked to record on which days they wore their pedometer and if worn whether it was for the whole day.

Pedometers were calibrated by the researcher, in line with the manufacturer's instructions; this involved entering a participant's weight, followed by their stride length. Stride length was calculated by asking participants to walk 10 strides and measuring the distance from start to finish. This number was then divided by 10.

Due to feasibility nature of this section of the study only a limited amount of pedometers were available for use and so convenience sampling was used to select which participants were invited to take part, depending on participant willingness and the availability of pedometers. Raw data scores were stored on the pedometer and then recorded by the researcher upon return of the pedometer from

the participant. Participants were not offered any additional reimbursement for participating in this section of the study above the £15 of supermarket vouchers for the survey completion, however feedback was provided on their step counts and its relation to current recommendations if so desired.

4.6.9 Quantitative data analysis

Descriptive statistics in the form of means and medians (plus standard deviations and interquartile ranges respectively) are presented where appropriate, dependent on the distribution, normal or otherwise, of the data. Normal distribution was assessed through the use of Shapiro-Wilks tests. Due to the large sample size (n = 100), parametric statistics were performed, involving the use of t-tests, ANOVAs and correlations. Pedometer data gathered from the smaller sub-sample of individuals was found to be normally distributed and so parametric statistics were used once again. Statistical analyses were conducted using the Statistical Package for Social Sciences (SPSS), version 19.

4.7 Qualitative phase

4.7.1 Overview

In line with the sequential explanatory approach outlined earlier in this chapter, the second stage of this study involved a qualitative approach. The purpose of this stage was to build upon the quantitative findings as well as explore topics that are difficult to capture through quantitative data, such as individuals' experiences of PA. The qualitative stage sought to collect further data on individuals PA levels including the amount and types of PA participated in, both at the time of interview and as well past experiences. In order to further understand individuals' PA, the factors influencing participation, the perceived barriers and enablers to PA were explored in the context of a social ecological approach. Participants' attitudes towards PA as well as future aspirations and goals for participation were also explored.

Objectives:

1. To explore the previous PA experiences of individuals receiving OST
2. To explore the current PA habits and attitudes of individuals receiving OST, including both structured and habitual forms of PA, as well as time spent being sedentary
3. To explore the factors influencing PA and taking into account both structured and habitual forms of activity, in individuals receiving OST from a social-ecological perspective
4. To explore the future goals and aspirations for PA in individuals receiving OST

4.7.2 Qualitative data collection

The qualitative data were collected using semi-structured interviews carried out by the researcher. There are generally considered to be three main types of interview, which differ by level of structure: structured, semi-structured and in-depth interviews (Bryman, 2004). Semi-structured interviews were deemed most appropriate for this study as they allow for the covering of relevant topics as highlighted before the interview – and in this case informed by previous research as well as the findings from the quantitative phase of the study. However unlike a questionnaire framework, semi-structured interviews are flexible and allow for the additional exploration participants' personal opinions and experiences, as well as the exploration of any themes or topics which may arise during the course of the interview – particularly useful in a population such individuals receiving OST on which there is limited existing research in the area (Ritchie and Lewis, 2011).

Prior to interview participants were asked to give their informed consent through the reading of the study information sheet (Appendix I) and the signing of a consent form (Appendix J). The interviews were conducted with the aid of an interview topic guide (Appendix K) and digitally recorded using an audio voice recorder. One pilot interview was conducted prior to the main phase of data collection with an individual who had participated in the quantitative phase of the study but had since come off their OST and so was ineligible to participate in the

qualitative phase. The pilot interview allowed for the testing of the scope of the topic guide – a critical part of the research process (Ritchie and Lewis, 2011). No changes were made to the topic guide or interview process following the initial pilot interview.

Following the pilot interview, 30 individuals receiving OST were interviewed. A combination of participants who had participated in the previous quantitative stage (n = 10) and new participants (n = 20) took part. Two individuals who were approached to take part in the study declined, due to a lack of time. Those individuals who had participated in the previous stage of research were contacted directly by the researcher regarding participation as had been previously agreed by the participant at the end of contact during the quantitative data collection. New participants were recruited through pharmacies using the same procedure as the quantitative phase. The same pharmacies were used that had already agreed to participate in the previous stage of research and so the researcher attended each pharmacy and spoke directly to potential participants after the initial approach was made by pharmacy staff. Participants were again recruited from two locations, with half of the sample (n = 15) from City A and the other half (n = 15) from City B. Interviews took place within a community setting such as a café or public park/outside space and lasted a mean duration of 80 minutes (range: 45-120 minutes). Following the completion of each interview participants were debriefed on the research process and reminded in line with the study information sheet what their data would be used for and with emphasis on the anonymous and confidential nature of all data use. Participants were given the opportunity to ask any further questions about the research process and were each reimbursed through £15 in supermarket vouchers as thanks for their time given to participate in this phase of the study.

4.7.3 Qualitative data analysis

All interview recordings were transcribed verbatim and subsequent transcripts were checked against original recordings for accuracy. Transcripts were then imported into and managed using MAXQDA – a software program designed for computer-assisted qualitative data analysis. A number of different types of

computer-assisted qualitative data analysis software (CAQDAS) have come into existence since the 1980s (Ritche and Lewis, 2011). Software can be categorized into a number of different types but are generally used for organizing, categorizing and searching data. In comparison to manual methods the main benefits of using CAQDAS methods are the speed at which data can be handled; improvements in rigour or consistency of approach; the facilitation of team research; and the relative ease of navigation and linking of data (Ritchie and Lewis, 2011).

While software can be used to help manage qualitative data, analysis still has to be performed to move the raw data into key concepts leading to an explanation and understanding of the problem under investigation. A wide variety of approaches exist for analyzing qualitative data and of these, the Framework approach (Ritchie and Spencer, 1994) to qualitative data analysis was selected for use in this study. Developed originally for use in large-scale policy research, the Framework approach is now widely used in health-related research. Sitting within a broad family of thematic analysis methods, the Framework approach can be used to identify commonalties and differences in qualitative data, before focusing further on the relationships between different parts of the data, in order to draw descriptive and/or explanatory conclusions clustered around themes (Gale et al., 2013). Differing from grounded approaches to qualitative data collection and analysis, a key component of Framework approach is the statement of research objects in advance based on the project requirements (Pope, Ziebland and Mays, 2006). In addition the Framework approach is not aligned with any particular epistemological, philosophical or theoretical approaches, making it a flexible tool that can be adapted for use (Gale et al., 2013). The Framework approach has also been highlighted as being of benefit to novice researchers, due to its explicit description of the process guiding data analysis from initial data management through to the development of descriptive and/or explanatory accounts (Smith, 2011).

The Framework approach consists of a systematic and transparent approach to organizing and synthesizing qualitative data, comprising five stages (Ritchie and Lewis, 2003; 2011). As per the first stage of the framework approach, qualitative

data analysis in this study began with the 'familiarization' of the data through the reading of interview transcripts and re-listening to of the interview audio recordings. As the researcher had conducted and transcribed all of the interviews herself, this also aided her familiarity with the data. It was at this point of the analysis that data were anonymised, with pseudonyms given to all participants and any other potentially identifying people or places. The second stage of data analysis involved 'identifying a thematic framework' – thereby identifying the key issues, concepts and themes by which the data could be examined and referenced. This was guided by the original aims of the study as well as emergent topics from the quantitative stage of research that had led to the structure of the topic guide used to inform the qualitative data collection, which was then used to label the data for analysis. The analytical categories identified in the thematic framework were then applied to the data through a process of 'indexing' (stage three). This involved coding the interview transcripts with numerical codes for each theme or sub-theme of the framework and was performed using MAXqda, as opposed to by hand. Samples of coding and subsequent analysis were also discussed with the more experienced qualitative researchers of the researchers' supervisory team. The indexed framework was then 'charted' (stage four), which involved separating the chunks of data and rearranging them under each of the thematic framework headings in a spreadsheet. At this point data from each category was also summarized and references to interesting or illustrative quotes were also highlighted. Gale et al. (2013) suggested that a key component of good charting is the striking of a balance between the reduction of data, while still retaining the original meanings and feel of interviewees' words; and so particular attention was paid to ensuring that these original meanings were retained. The final stage of analysis involved the 'mapping and interpretation' of the data. Here the charted data was compared and contrasted in order to search out patterns and explanations for the findings. With this, summarized descriptive accounts of the data were produced for each theme, along with further explanatory accounts between other themes, participant groups and the existing literature.

All the above steps taken by the researcher to inform and undertake the data analysis phase were recorded in order to form an audit trail. This included notes

and reflections made during both fieldwork and analysis, as well as the steps taken with the data during the Framework analysis process.

4.8 Ethical considerations

When undertaking any research the minimization of potential risk to both participants and the researcher are important issues. In this study a number of steps were taken to ensure the safety and well-being of all those involved in the research project. The first step in doing this was to obtain ethical approval from both Oxford Brookes University and the National Research Ethics Service for each of the two phases of the study (reference numbers: 10/H0606/59 and 11/SC/0247 for the quantitative and qualitative phases respectively).

While the nature of questions asked to participants in each phase were not anticipated to cause upset or distress to participants, it was made clear that they did not have to answer anything that made them feel uncomfortable and that the interview could be suspended or terminated at any point. It was also emphasized to all individuals that their drug treatment from any service would not be in any way impacted regardless of their decision to participate (or not) in the research study. Issues of confidentially and anonymity were assured with an explanation that this would only be compromised if participants were to state an intent to seriously harm themselves or another individual. Given the nature of the research topic participants were also reminded at the start of each phase of data collection that they should not disclose any specific details relating to an illegal activity. All paperwork was stored in a securely locked filing cabinet and audio files and transcribed interviews were saved on a password-protected computer.

With regard to the safety of the researcher, both the physical and emotional well-being of those carrying out research have been highlighted as important, yet overlooked aspects of many research projects (Appleton, 2009). In this study all meetings with participants (both survey administration and interviewing) were conducted in public areas to ensure the physical safety of the researcher. Additionally, details of the time and location of each meeting were left with a third party and regular contact was made back to this individual to confirm the

end of each fieldwork session. In line with the University's lone worker guidelines risk assessments were conducted for each stage of fieldwork, with both phases of data collection considered to be low risk and the steps taken to ensure safety deemed sufficient. In terms of the emotional well-being of the researcher, the researcher's supervisory team and colleagues were available to 'offload' the emotional burden (should it have arisen) that can build up when engaging in sensitive research topics that often involve stories of distress (Hubbard, Backett-Milburn and Kemmer, 2001).

4.9 Chapter summary

As outlined in this chapter, this study employed a mixed methods approach involving a quantitative stage (comprising surveys and a smaller pedometer feasibility study) followed by qualitative interviews. This approach was undertaken due to the highlighted benefits in the literature of using a mixed methods approach to gain a fuller understanding of the research problem, compared to using a single approach alone. The subsequent two chapters will now present the findings and discussion for each of these phases of the study.

Chapter 5

Quantitative phase: findings and discussion

5.1 Chapter introduction

This chapter presents the findings of the quantitative phase of this mixed methods study. Firstly, the demographic characteristics of the sample will be provided, followed by the findings from the surveys on PA participation, health-related quality of life and perceived benefits and barriers to PA. Objective PA data gathered through the use of pedometers will also be presented. A discussion of the findings of this phase is provided at the end of the chapter.

5.2 Quantitative objectives

As highlighted earlier in the methods, the main objectives of this quantitative data collection were as follows:

Primary objectives:

1. To describe the physical activity levels of individuals receiving OST
2. To describe the health-related quality of life of individuals receiving OST
3. To describe the perceived barriers and benefits to physical activity participation in individuals receiving OST
4. To validate self-reported physical activity in a sub-sample of individuals receiving OST through pedometer data

Secondary objectives:

5. To compare physical activity levels within individuals receiving OST
6. To explore the relationship between physical activity level and health-related quality of life in individuals receiving OST

7. To explore the relationship between physical activity level and perceived barriers and benefits to physical activity participation in individuals receiving OST
8. To assess the feasibility and acceptability of the use of pedometers to measure physical activity in a sub-sample of individuals receiving OST

5.3 Characteristics of the sample

An overview of the key demographic characteristics of the sample are presented below in Table 2. Due to the sample size of 100 participants and complete response rate of all participants for all questions, numbers presented represent both the number of participants and the percentage of the sample.

Table 2. Summary of key demographic characteristics of the sample of 100 individuals

Characteristic	Frequency (n)	Percentage (%)
Gender		
Male	75	75.00
Female	25	25.00
Age		
18-29	23	23.00
30-45	63	63.00
46-57	14	14.00
Ethnic background		
White British	86	86.00
Other	14	14.00
Location		
City A	50	50.00
City B	50	50.00
Marital Status		
Single	67	67.00
Partnered	33	33.00
Employment status		
Employed	10	10.00
Unemployed	90	90.00
Current OST		
Methadone	82	82.00
Buprenorphine	18	18.00
Current illicit drug use		
Yes	61	61.00
No	39	39.00
Current injecting drug use		
Yes	22	22.00
No	78	78.00

Note: percentages presented to two decimal places.

5.3.1 Biographic and socio-demographic characteristics

One hundred participants were recruited from two cities in Southern England (City A: n = 50; City B: n = 50) and had a mean (SD) age of 37 (9). The sample comprised 75 males and 25 females. Eighty-six participants self-identified their ethnicity as White British, three as White Irish, three as Mixed White and Caribbean. All other ethnicities were each reported by only one individual.

A large number of participants were living in their own flat or house (n = 68) at the time of interview. Other forms of accommodation included living with family and friends (n = 19), staying in a hostel or shelter (n=10) and sleeping rough (n=3). Over half of participants (n = 55) reported that they were living alone. Only 10 participants were in employment, with three individuals in part-time work and seven individuals employed full-time. Eighty-nine participants were receiving state payments in the form of one or more benefits. Sixty-seven participants described their relationship status as single, with 33 participants either married or partnered. Over half (n = 55) of the sample had at least one child, however only 18 participants reported that they were currently living with any of their children. Of the 100 individuals sampled, 56 reported having previously spent time in custody. The total time spent in imprisonment varied among individuals from short stays of a week to multiple imprisonments totalling over 15 years.

5.3.2 Drug use

When asked about their drug use, 61 participants reported having used one or more illicit substances in the previous three days. Cannabis was the most widely used drug having been used by 34 participants. Thirty-one participants reported having used heroin in the previous three days and 26 had used crack cocaine. Other less widely reported substances included amphetamines, benzodiazepines and cocaine each used by no more than five individuals. Of those who had used an illicit drug in the previous three days, 23 individuals reported polydrug use (the use of one or more drugs).

Participants were also asked about their illicit drug in relation to the previous three months, with substance use reported by 81 individuals. Again, cannabis use was most widely reported by 54 participants, closely followed by heroin (n = 52) and then crack cocaine (n = 44). Other substances used included amphetamines, benzodiazepines, cocaine, ecstasy and street methadone (bought as opposed to prescribed to the individual), each used by five participants or less. Fifty-six participants reported polydrug use in the previous three months.

Over three quarters of the sample (n = 78) recounted having injected an illicit substance at some point in their lives. When asked whether they had injected in the previous three days this number reduced to 22 individuals. In addition to illicit drug use, participants were also briefly asked their consumption of other substances. Thirty-four individuals had consumed alcohol in the previous three days, with 38 of those sampled reporting 'feeling concerned' about the large amounts of alcohol they consuming. Almost all of those sampled were smokers, with 95 participants reporting that they smoked cigarettes on a daily basis.

5.3.3 Opioid substitution treatment

All 100 participants were receiving a form of OST for illicit opioid dependence. For 82 participants this treatment was in the form of methadone, with the remaining 18 participants receiving buprenorphine. The mean (SD) amount of methadone prescribed was 67 (28) mg/day, with those receiving buprenorphine reporting a median (IQR) prescription of 8 (7) mg/day. Seventy-four participants had been receiving methadone for over one year, with 17 individuals having surpassed 10 years on methadone. Most (n = 15) participants receiving buprenorphine had been doing so for less than five years, with eight individuals having started their buprenorphine treatment in the last 12 months.

5.3.4 Other forms of treatment for drug use

As well as their OST, participants were also asked about other forms of treatment they were currently or had previously received for their drug use. Thirty-two participants had previously attended a residential detox service, with one

individual having attended a detox in the previous four weeks. No participants had been at a residential rehabilitation service in the previous four weeks, however 22 individuals had previously attended such a service at some point in their lives. Other non-residential treatments included one-to-one counselling, which 88 participants had previously received and had been undertaken in the previous four weeks by 69 of those individuals. Peer support groups such as Narcotics Anonymous and Alcoholics Anonymous had also been utilised – by eight individuals in the previous four weeks and 47 individuals at some point in their lifetime.

5.3.5 Health and well-being

Participants were asked whether they were receiving any other prescription drugs aside from their OST for both physical and psychological health problems. Half of the sample (n = 50) reported being in receipt of a prescription, with 31 individuals receiving two or more prescription drugs. Depression was the most frequently cited reason for receiving a prescription drug (n = 29). Other psychological health problems resulting in prescribed medication were anxiety (n = 10), psychosis/schizophrenia (n = 9) and insomnia (n = 7).

Physical health problems requiring prescribed drugs were also prevalent. Asthma was the most commonly cited reason (n =15), followed by the need for pain relief from a physical condition (n = 7) and epilepsy (n = 6). Other physical health problems for which participants had been prescribed medication included diabetes, gastrointestinal disorders, heart failure, hypertension, hypothyroidism, infection and vitamin B deficiency. None of these conditions were each reported by more than five participants.

In order to gain a picture of the daily routines of the sample, participants were also asked about their dietary and sleep patterns. The mean (SD) number of meals and snacks eaten the previous day was 1.5 (1.0) and 2.0 (2.0) respectively. Over half (n = 63) of the sample described their sleep pattern as either quite poor or very poor with a further 15 individuals feeling that their sleep pattern was neither good nor poor. Only 22 individuals identified their sleep pattern as (quite or very) good.

5.4 Health-related quality of life

All participants completed all 36 questions of the SF-36 questionnaire. The health-related quality of life scores for the whole sample can be seen in Table 1. A mean (SD) score of 57.6 (23.6) was reported for the scale as a whole, and 57.8 (24.2) and 53.0 (23.6) for the physical health and mental health summary scores respectively. The subscale scores for the sample ranged from 47.1 (21.3) on the vitality subscale to 82.1 (25.5) to on the physical function subscale.

Table 3. A table showing mean and standard deviation SF-36 scores for 100 individuals receiving OST

SF-36 health scales	Mean (SD)
SF-36 subscales	
Physical Function	82.1 (25.5)
Physical Role Functioning	56.0 (41.0)
Bodily Pain	56.9 (32.9)
General Health	47.9 (27.2)
Vitality	47.1 (21.3)
Social Functioning	63.2 (30.6)
Emotional Role Functioning	49.3 (43.3)
Mental Health	57.6 (22.0)
SF-36 summary scales	
Physical Health	57.8 (24.2)
Mental Health	53.0 (23.6)
Total SF-36 score	57.6 (23.6)

Note: Scores are on a 0-100 scale, with higher scores indicating a better state of health

5.4.1 Comparing health-related quality of life within the sample

Differences in health-related quality of life between subtypes of the sample based on key demographic variables were explored. Male participants reported significantly higher total scores of health-related quality of life compared to females (47.9 [24.5] versus 60.8 [22.6], $P < 0.05$). There was also a significant difference in health-related quality of life when participants were considered based on the type of OST they were receiving. Participants receiving buprenorphine reported significantly higher total scores when compared to individuals receiving methadone (67.5 [23.1] versus 55.4 [23.3], $P < 0.05$). In addition to differences between types of OST, significant differences were found between participants receiving other prescription medications for other health conditions. Those participants who were not in receipt of additional prescribed medication scored significantly higher total scores compared to those who were receiving other prescribed medication (49.2 [21.3] versus 66.0 [23.1], $P < 0.001$).

When health-related quality of life and illicit drug use were explored, participants who had used an illicit drug in the previous three days reported significantly lower mental health scores than those who had not used an illicit substance in the previous three days (49.1 [22.0 versus 59.2 [25.0], $P < 0.05$). However there were no significant differences in physical health or total scores based on illicit drug use in the previous three days. In terms of illicit drug use in the previous three months, significantly lower total scores were reported by individuals who had used an illicit substance than those who had not (55.0 [22.5] versus 68.6 25.8], $P < 0.05$)

5.5 Self-reported physical activity levels

The PA levels of the sample were assessed through two methods: a self-report questionnaire and the use of a pedometer. The self-report questionnaire was the main form of PA data collection in this study and was completed by all 100 participants. A modified Paffenbarger Physical Questionnaire (PPAQ) was used to assess current levels of self-reported PA. The three major components of the

PPAQ are (i) stairs climbed, (ii) walking – measured in miles in this study, and (iii) time spent engaged in sport, exercise or other active recreational activities.

Participants reported climbing a median (IQR) of 55 (80) stairs and walking a median (IQR) of 3.0 (3.5) miles on a typical a day in the last week. Fifty-four participants reported that they had participated in sport, exercise or another form of active recreational activity in the past week. The three most widely participated in activities were cycling, the use of a gym and swimming. The variety of activities participated in as well as the number of individuals participating in each, can be seen in Chart 1. Of the 54 individuals who reported having engaged in sport, exercise or another active recreational activity, 20 individuals had participated in two different activities and five individuals had undertaken three different activity types.

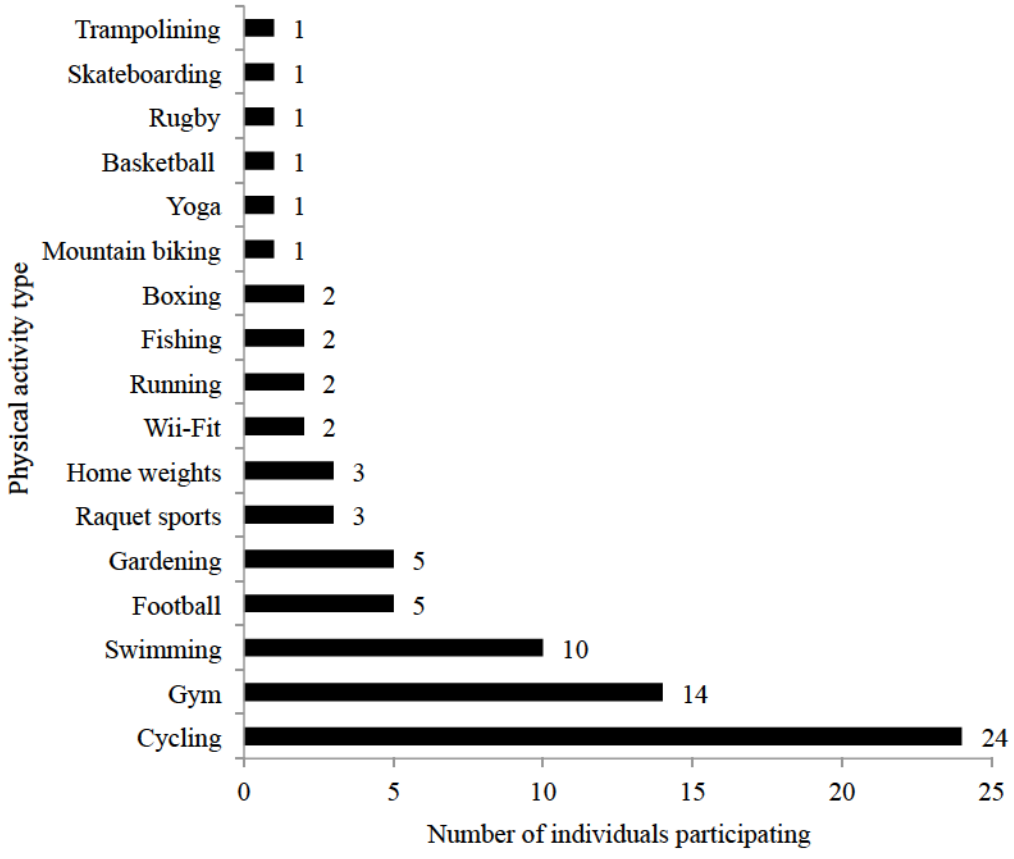

Figure 1. A bar chart showing the number of individuals participating in each type of sport, exercise or active recreational activity as recorded through the use of the Paffenbarger Physical Activity Questionnaire.

The PPAQ also allowed for the calculation of the estimated amount of energy expended through PA in the previous week. The median (IQR) total energy expenditure was reported as being 3,626 (4,202) kcal/week. Across all participants the range of energy expenditure ranged from 56 kcal/week to 28,208 kcal/week. The energy expenditure breakdown in terms of each of the components of the PPAQ (Table X) was as follows: (i) 154 (224) kcal/week through stairs climbed, (ii) 2,016 (2,352) kcal/week through miles walked, and (iii) 413 (2,681) through time spent participating in sport, exercise or other active recreational activities (all presented as median and IQR).

Table 4. Median and interquartile ranges (IQR) of energy expended through physical activity during one week, as calculated through the Paffenbarger Physical Activity Questionnaire

Activity	Median and IQR (kcal/week)
Total physical activity	3,626 (4,202)
Stairs climbed	154 (224)
Miles walked	2,016 (2,325)
Sport, exercise or other recreational activities	413 (2,681)

A large proportion of participants reported high levels of PA, with 55 individuals expending 3,000 kcal/week or more through PA and a further 17 individuals expended between 2,000 kcal/week and 2,999 kcal/week. Just over a quarter (n = 28) of the sample reported expending less than 2,000 kcal/week, with 13 individuals expending fewer than 1,000 kcal/week.

5.5.1 Comparing the physical activity levels of subcategories of the sample

When recruitment location was explored in terms of differences in PA levels, participants living in City A reported expending significantly more kcal/week than those living in City B (1,350 [4,238] versus 112 [1,744] kcal/week, $P < 0.05$) through sport, exercise or other active recreational activities. No other significant differences were found between the two recruitment sites in terms of stairs climbed, miles walked or total energy expenditure.

Table 5. Median and interquartile ranges (IQR) of energy expended through sport, exercise or other active recreational activities during one week as calculated through the Paffenbarger Physical Activity Questionnaire, per recruitment location

Recruitment location	Median and IQR (kcal/week)
City A	1,350 (4,238)*
City B	112 (1,744) *

Note: * difference significant at the 0.05 level

The energy expended through sport, exercise or other active recreational activities was also significantly higher among individuals who had used cannabis in the previous 3 days than those who had not (1,425 [4,200] kcal/week versus (0 [2,334] kcal/week, $P < 0.01$). Total energy expenditure through all PA was also significantly higher among individuals who had used cannabis in the previous three days than individuals who had not (4,432 [5,238] kcal/week versus 3,172 [3,832] kcal/week, $P < 0.01$).

Table 6. Median and interquartile ranges (IQR) of energy expended through sport, exercise or other recreational activities and total physical activity during one week as calculated through the Paffenbarger Physical Activity Questionnaire, per cannabis use in the previous three days

Cannabis use in previous 3 days	Energy expended through sport, exercise or other recreational activities (kcal/week)	Energy expended through total physical activity (kcal/week)
Yes	1,435 (4,200)**	4,432 (5,238)**
No	0 (2,334)**	3,172 (3,832)**

Note: ** significant at the 0.01 level

5.5.2 Associations between self-reported physical activity and health-related quality of life

The relationship between self-reported PA through the PPAQ and health-related quality of life as assessed by the SF-36 was also explored for the sample as a whole. A weak positive correlation was found between total energy expended through PA and total SF-36 score (rho = .260, n = 100, P = < 0.01).

5.6 Objectively measured physical activity through pedometer use

5.6.1 Key demographics of the sub-sample

A smaller sub-sample of 26 individuals from the 100 original participants were provided with pedometers. Of these 26 individuals, 24 returned useable pedometer and a brief description of this sub-sample is as follows. Seventeen individuals were male and 7 were female. The sample comprised an entirely White ethnic background, with 23 individuals being White British and one individual White Irish. Methadone was the predominant form of OST received (n = 20) and most

individuals had been receiving their OST for longer than six months (n = 22). Half of the sub-sample (n = 12) had used an illicit drug in the previous three days, with heroin (n = 8), crack cocaine (n = 6) and cannabis (n=5) being the most frequently reported. Five individuals had injected an illicit drug in the previous three days.

5.6.2 Feasibility of pedometer use

Pedometers were distributed to 26 of the 100 participants recruited for the original larger study. Of these 26 participants, useable data was provided by 24 individuals. Of the two participants from whom useable data was not provided, one individual did wear a pedometer for five out of the seven days requested, however on the fifth day water damage resulted in the step counts being irretrievable; and contact was lost with the other participant, with no pedometer being returned at the end of the seven days and thus no information was provided on the number days on which the pedometer was worn or the number of steps undertaken.

All participants were asked to complete log sheets alongside the wearing of pedometers to indicate the number of complete days on which pedometers were worn. All 24 participants reported wearing their pedometers for at least three full days, the minimum required to use the data. Eight individuals wore their pedometers on all seven days; 10 wore their pedometers on six days; three wore their pedometers on five days; and one and two individuals wore their pedometers on four and three days respectively.

5.6.3 Pedometer measured step counts

Pedometer readings showed a mean (SD) of 12,085 (5,126) steps/day. The smallest number of steps walked by any participant was 427 steps/day and the largest was 45,836 steps/day. The mean, standard deviation and range of steps walked by each of the 24 participants can be seen in Table 2.

Table 7. A table showing the means, standard deviations and ranges of steps/day recorded by a sub-sample of 24 participants through the use of pedometers

Participant	Mean (SD) steps/day	Range (steps/day)
ID1	13,025 (2,178)	6,134
ID2	11,578 (4,100)	10,295
ID3	20,560 (13,458)	39,685
ID4	6,308 (3,193)	7,902
ID5	14,376 (3,419)	8,602
ID6	4,026 (2,499)	5,669
ID7	4,020 (2,345)	5,882
ID8	11,614 (2,163)	5,806
ID9	12,883 (4,997)	14,117
ID10	10,142 (4,017)	11,227
ID11	18,263 (8,211)	21,196
ID12	13,755 (3,122)	8,004
ID13	15,179 (3,564)	9,375
ID14	9,315 (6,500)	14,504
ID15	9,329 (2,186)	7,068
ID16	9,334 (1,125)	2,168
ID17	21,600 (2,868)	8,082
ID18	3,278 (2,392)	4,715
ID19	10,703 (7,687)	20,391
ID20	16,077 (3,613)	11,463
ID21	6,836 (2,871)	7,489
ID22	17, 071 (13,756)	35,646
ID23	18,887 (1,923)	5,126
ID24	11,874 (3,821)	9,891

5.6.4 Association between pedometer step counts and self-reported physical activity

The extent to which pedometer step counts and self-reported PA through the PPAQ were related was also examined. A moderately significant correlation was found between mean daily step counts and self-reported miles walked per day (rho .396, n = 24, p = .028, one-tailed). A scatterplot of the relationship between step count and self-reported miles walked is presented in Chart 2. Pedometer step counts were not found to be significantly correlated to any other forms of self-reported PA through the PPAQ (stairs climbed or other sport, exercise or active recreational activities). There was also no significant correlation when step counts were plotted against total energy expenditure through PA as calculated through the PPAQ.

Based on the assumption that 2,000 steps equates to approximately one mile of walking (Bassett and Strath, 2002); when participants' mean pedometer step counts were transformed into mile equivalents and compared to their PPAQ estimated miles walked, 23 out of the 24 participants had reported fewer walking miles on the self-report questionnaire than recorded through the use of the pedometer.

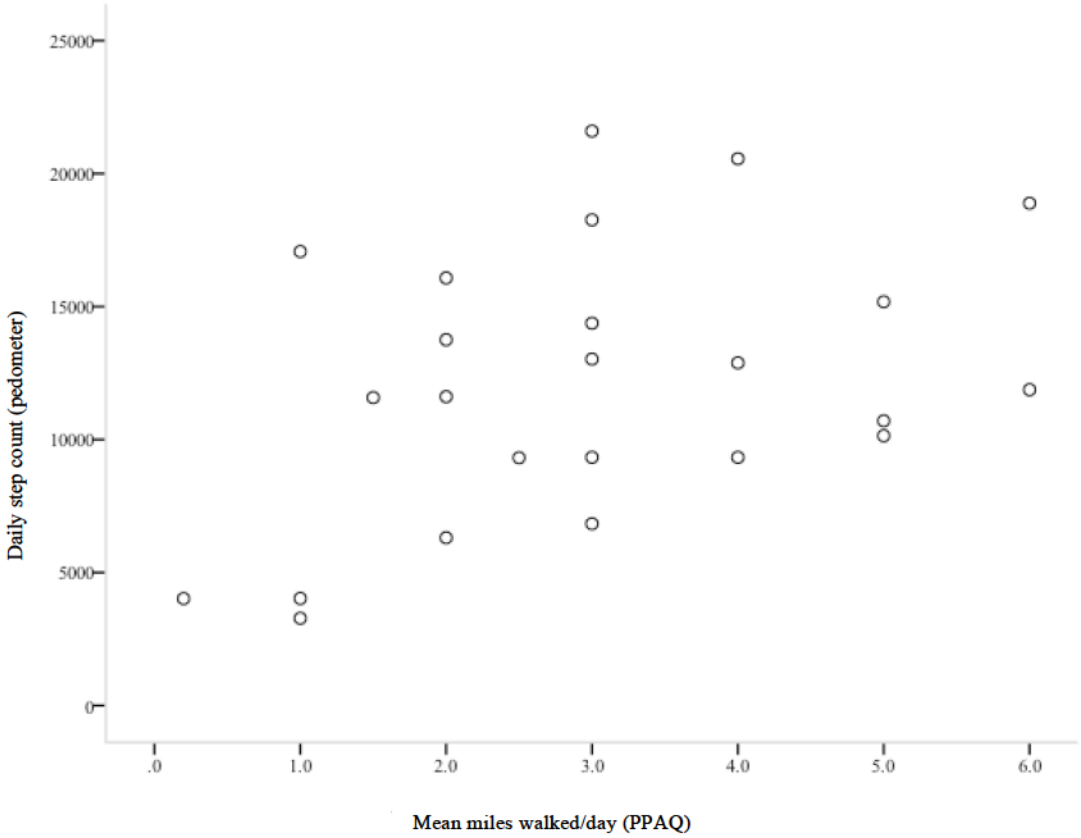

Figure 2. A scatterplot showing the relationship between mean daily step count as measured by a pedometer and self-reported miles walked through the Paffenbarger Physical Activity Questionnaire .

5.7 Perceived benefits and barriers to physical activity

The perceived benefits and barriers to PA were measured using the Exercise Benefits/Barriers Scale (EBBS) (Sechrist, Walker and Pender, 1987). Participants scored a mean (SD) of 124.81 (10.88) when the scale was used as a whole (possible scoring range: 43-172). The scale was also broken in two to provide separate benefits and barriers scores. Participants 86.86 (9.25) on the benefits scale (possible scoring range: 29-116) and 37.95 (4.02) on the barriers scale (possible scoring range: 14-56).

Table 8. A table showing the mean (SD) scores for the total Exercise Benefits/Barriers Scale, as well as the separate Benefits and Barriers Scales for 100 individuals receiving opioid substitution treatment

Scale	Mean (SD)
EBBS	124.81 (10.88)
Benefits Scale	86.86 (9.25)
Barriers Scale	37.95 (4.02)

5.7.1 Perceived benefits to physical activity

A mean score of three or higher was reported for 15 of the 23 benefits-related questions, indicating that participants did agree or strongly agree with two-thirds of the perceived benefits. The mean (SD) scores for each of the 23 items can be seen in Table 4. The most agreed with dimension of the benefits scale was 'physical performance', with the three highest scoring benefits being 'increased level of physical fitness', 'improved functioning of my cardiovascular system' and 'increased muscle strength'. The three least agreed with benefits of PA were 'helps me decrease fatigue', 'makes me feel relaxed' and 'lets me have contact with friends and persons I enjoy'.

Table 9. A table showing the mean (SD) scores for the Benefits Scale (of the larger Exercise Benefits/Barriers Scale) for 100 individuals receiving OST.

Benefits Scale items	Mean (SD)
Life Enhancement sub scale	
My disposition is improved by exercise	3.00 (.53)
Exercising helps me sleep better at night	2.94 (.60)
Exercise helps me decrease fatigue	2.76 (.59)
Exercising improves my self-concept	3.05 (.48)
Exercising increases my mental alertness	3.03 (.54)
Exercise allows me to carry out normal activities without becoming tired	2.99 (.56)
Exercise improves the quality of my work	2.91 (.57)
Exercise improves overall body functioning for me	3.11 (.45)
Physical Performance sub scale	
Exercise increases my muscle strength	3.18 (.46)
Exercising increases my level of physical fitness	3.24 (.49)
My muscle tone is improved with exercise	3.12 (.46)
Exercising improves functioning of my cardiovascular system	3.23 (.47)
Exercise increases my stamina	3.16 (.39)
Exercise improves my flexibility	3.07 (.43)
My physical endurance is improved by exercising	3.14 (.40)
Exercise improves the way my body looks	3.11 (.47)
Psychological Outlook sub scale	
I enjoy exercise	2.87 (.80)
Exercise decreases feelings of stress and tension for me	2.98 (.70)
Exercise improves my mental health	3.10 (.59)
Exercise gives me a sense of personal accomplishment	3.16 (.55)
Exercising makes me feel relaxed	2.76 (.60)
I have improved feelings of well being from exercise	3.08 (.49)
Social Interaction sub scale	
Exercising lets me have contact with friends and persons I enjoy	2.78 (.60)

Note: scored on a four-point Likert-type scale where 1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree.

5.7.2 Perceived barriers to physical activity

The mean (SD) scores for each of the 14 items of the Barriers Scale can be seen in Table 5. The most disagreed with dimension on the Barriers Scale was the Time Expenditure Sub Scale, with all three items scoring highest in disagreement in their status as barriers to PA. These items were 'takes too much time from family relationships', 'takes too much time away from my family responsibilities' and 'takes too much of my time'. The most agreed with dimension of the Barriers Scale was the Physical Exertion Sub Scale, with the three following items scoring lowest: 'tires me', 'I am fatigued' and 'hard work for me'. The remaining eight items scored mean values in the range of neutral to approaching agreement (2.57 to 2.92).

Table 10. A table showing the mean (SD) scores for the Barriers Scale (of the larger Exercise Benefits/Barriers Scale) for 100 individuals receiving OST.

Barriers Scale items	Mean (SD)
Exercise Milieu sub scale	
Places for me to exercise are too far away	2.89 (.71)
I am too embarrassed to exercise	2.90 (.70)
It costs too much money too exercise	2.92 (.72)
Exercise facilities do not have convenient schedules for me	2.84 (.53)
I think people in exercise clothes look funny	2.73 (.60)
There are too few places for me to exercise	2.83 (.60)
Time Expenditure sub scale	
Exercising takes too much of my time	3.03 (.54)
Exercise takes too much time from family relationships	3.05 (.46)
Exercise takes too much time from my family responsibilities	3.05 (.46)
Physical Exertion sub scale	
Exercise tires me	2.04 (.60)
I am fatigued by exercise	2.11 (.55)
Exercise is hard work for me	2.37 (.68)
Family Discouragement sub scale	
My spouse (or significant other) does not encourage exercising	2.57 (.64)
My family members do not encourage me to exercise	2.67 (.71)

Note: Scored on a reverse four-point Likert-type scale where 1=strongly agree; 2 = agree; 3= disagree; 4 = strongly disagree

5.7.3 Associations between self-reported physical activity and perceived benefits/barriers

The relationship between the perceived benefits and barriers to PA and self-reported PA was explored and a small significant positive correlation was found between the total EBBS score and total energy expended through PA as measured

by the PPAQ (rho = .262, n = 100, $P < 0.01$). No other significant associations were found between energy expended through any of the sub-components of the PPAQ (stair climbing, walking or participation in sport, exercise or other active recreational activities) and EBBS scores.

5.8 Discussion of the quantitative findings

Findings indicated that a large number of those individuals receiving OST sampled are physically active, with many undertaking high levels of PA. Current UK guidelines recommend that adults should accumulate over 150 minutes of moderate intensity PA or 75 minutes of PA at a combined moderate and vigorous intensity per week, in order to achieve a number of the associated benefits of PA participation (Department of Health, 2011). In terms of energy expenditure, these recommendations equate to approximately 1,000 kcal/week expended through PA. (O'Donovan et al., 2010). In this study 87% of participants reported achieving this recommended level of PA, with over half (55%) well-exceeding this number and expending 3,000 kcal/week or more through PA in the previous seven days. These findings compare favuorably to the most recent data from the English General population where 66% of men and 56% of women were reported as meeting the current PA recommendations (The Health and Social Care Information Centre, 2014).

The high levels of PA found in this study are in line with some other research in drug using populations. Also measured through the use of the PPAQ, a US study on the PA levels of HIV-negative and HIV-positive injecting drug users found similar total weekly energy expenditure through PA consisting of mean values ranging from 2,899 kcal/week to 3,149 kcal/week respectively (Smit et al., 2006). Even higher levels of PA were reported in a small UK study involving class A drug users, in relation to their PA levels in the community in the week before entry into prison (Fischer et al., 2012). Again, through the use of the PPAQ, a mean weekly energy expenditure through PA of 5,007 kcal/week was reported; higher than the mean of 3,626 kcal/week found in this study. However, the only other study to have explored PA in a population of individuals receiving OST (in the form of methadone) found much lower levels of participation, with just 38% of those sampled meeting or exceeding PA recommendations (Caviness et al., 2013). This difference compared to the current study may be due to a number of factors, including the different recruitment criteria for participation and subsequent sample differences; cultural differences between the US and UK; and differences in the tools used to measure PA.

In relation to significant differences in PA between sub-categories of the sample, differences were found between the two recruitment sites and between cannabis and non-cannabis users of the previous three days. Based on the use of the social-ecological approach framing the understanding of PA in this study, influences on PA may have been influenced by multiple factors at the individual, social, environmental and policy level. Differences in PA between recruitment locations suggest the possible emphasis of the role of wider influences beyond the individual in this sample. The subsequent stage of qualitative data collection allows for the further exploration of the potential influences on PA.

Walking was the main PA type participated in by those in this study, with 46 participants having not participated in any sport, exercise or other active recreational activities in the past week. These findings are similar to those found by Fischer et al. (2012), where only eight out of 25 class A drug users reported participating in sport, exercise or other activity prior to entering prison. In their study of heroin users Neale, Nettleton and Pickering (2012) also found that participation in structured forms of sport and exercise was low during heavy periods of drug use, but walking and cycling, identified as forms of active transport were high.

In this study after cycling, the using of a gym and swimming were the most participated in forms of structured PA, inline with the PA choices of the general population (Department for Culture, Media and Sport, 2011), highlighting the PA similarities between two. While data collection did not allow for the detailed exploration of PA participated in, forms of PA reported were largely individual based activities. The subsequent qualitative stage will further consider this aspect of individuals' PA choices.

The smaller feasibility study comprising the pedometer data of 24 participants also found high levels of walking above PA recommendations. The sample walked a mean of 12,085 steps/day, more than equivalent of 150 minutes of moderate activity, which equates to approximately 7,000 – 8,000 steps (Tudor-Locke et al., 2011). These levels are also higher than recommendations by

initiatives to get the population walking, which suggest 10,000 steps a day for benefits in health (National Health Service, 2012). When pedometer measured PA was correlated with self-reported data from the PPAQ, a moderately significant relationship was found between daily step counts and miles walked per day. No significant associations were found with stair climbing; sport, exercise or other active recreational activities; or total energy expenditure from all PA. Given the small sample size of individuals who provided pedometer data the moderately significant correlation does provide an element of validity to the self-reported walking scores of individuals in the larger study. Data from this sample showed that 23 of the 24 participants reported lower levels of PA when surveyed compared to pedometer-recorded data. This in contrast to a large amount of existing data, which suggests that individuals tend to over report PA levels through self-report measures (Klesges et al., 1990); however, in line with other research suggesting under-reporting of PA through the PPAQ (Ainsworth et al., 1993). This study demonstrated that it is feasible to use pedometers to assess PA in individuals receiving OST with good levels of compliance shown to both pedometer wearing and the completion of pedometer logs.

As highlighted, data suggests that the majority of participants reported levels of PA, which surpassed current recommendations for time engaged in PA. However current PA guidelines now also include the additional recommendation of PA to improve muscle strength at least bi-weekly (Department of Health, 2011), which based on the data collected was not being achieved by a large section of the sample. Additionally the PA data collection methods used did not allow for the capture of the time participants were spending engaged in sedentary activities, another key aspect of current PA guidelines. Given the low levels of employment in the sample as a whole and the section of participants who reported very levels of energy expended through PA, it is of interest in the qualitative phase of this study to explore how much of this populations' time is spent being inactive.

In addition to attempting to quantify PA levels in this population, preliminary data was also gathered in relation to participants' perceived benefits and barriers to participation. Findings point towards this group viewing PA as beneficial with few barriers, similar to the findings of Caviness et al. (2013) in relation to

individuals receiving methadone treatment. The mean total score as measured by the EBBS was high – 124.81 out of a possible 172. In comparison, a study by Kennedy et al. (1998) found that individuals reached a score of 135 after a nine-month exercise intervention. The highest perceived benefits of PA in this study related to physical performance, with 'increased level of physical fitness', 'improved functioning of my cardiovascular system' and 'increased muscle strength' scoring highest. In a sample of the UK population when asked about the perceived benefits of PA participation health, exercise and fitness was also the most widely cited benefit (Department for Culture, Media and Sport, 2011). Items associated with physical exertion were perceived as the biggest barriers to PA, with 'tires me', 'I am fatigued' and 'hard work for me' being the most agreed with barriers. Other barriers were scored neutrally/approaching agreement with stated barriers, suggesting that beyond physical barriers, other social and environmental barriers may also be perceived by some participants, in line with the notion of multiple influences on behaviour suggested by social-ecological approaches.

In a UK survey when asked about reasons for non-participation lack of time was the most frequently cited barrier (48%), followed by health reasons (40%) and cost (11%) (Department for Culture, Media and Sport, 2011). While there are similarities between those sampled and the general population in the role of health there was a stark contrast in the perception of time available to be active. While this is often reported as a major barrier within the general population, in this population time 'time expenditure' was the was the most disagreed with category of the Barriers Scale, with all three items being disagreed with. As seen through the collection of demographic data, the majority of the sample were unemployed which may relate to the perceived availability of time in which to be physically active. This also highlights the relevance of exploring how this population uses their spare time, in particular in relation to sedentary behaviour. It is also worth further exploration in the quantitative phase of research as to the important role of physical health in this population, as both the highest scored perceived benefit and barrier categories both related to physical health. The poor health of drug using populations has been highlighted in existing research (Neale, 2004) as well as being apparent in this study through the high number of prescriptions received for health conditions and low SF-36 scores.

The significant positive relationship between the total EBBS score and total energy expenditure through PA is inline with findings from other populations including college students (Grubbs and Carter, 2002) and pregnant women (Da Costa and Ireland, 2013), highlighting the influence of perceived barriers and benefits in relation to participation. One point worth mentioning is that the EBBS was used to provide preliminary data in relation to total PA in this population. However, as the findings indicate that this group are much more active in certain types of PA (walking) than others (sport and exercise), the qualitative phase of this study will aim to play an important role in building upon these findings and exploring perceived barriers in particular to sport and exercise as well as mechanisms for overcoming barriers.

Despite the high levels of PA in this sample, low levels of health-related quality of life were found, although a positive correlation was found between PA and health-related quality of life, albeit a weak one. The scores found in this sample of individuals receiving OST were in line with SF-36 scores reported in a large sample of drug users (Neale, 2004), wider data on lower levels of health-related quality of life in individuals receiving OST and lower than those of the most recent SF-36 data from the UK general population (Jenkinson et al., 1999). The magnitude of the difference in scores between those sampled and UK general population data was large on a number of scales, with four scales differing by over 20 points and three scales over 10 points. The closest scoring scale was physical functioning, differing by just over five points. These findings highlight the poor health of this sample of individuals receiving OST. Based on existing research and demographic data from this sample including half of the sample receiving prescriptions for health conditions; poor dietary patterns; poor quality of sleep; low levels of employment; in addition to drug use and OST, it is not surprising that low-levels of health-related quality of life were found. The fact that the sample of individuals receiving OST and the general population scores were similar for physical functioning is of interest given that that the scale asks about the extent to which their health limits them in vigorous and moderate activities as well as activities such as walking and stair climbing. Given the findings that this

population is by and large a physically active one – in particular through walking – this seems to be reflected in the SF-36 scoring.

Increased participation in meaningful activities, with the aim of contributing to improved well-being and quality of life as part of individuals' recovery from problem drug use, has been highlighted as of importance within UK policy. While this sample did report high levels of PA participation, reported health-related quality of life was low. In terms of further research and the potential clinical implications of these findings, further understanding is required of the types of PA individuals are participating in and their reasons for certain types of participation. For example, PA participation largely occurred through walking, rather than structured forms of sport and exercise. Additional benefits may be gained from PA that includes a social dimension, such as team and group activities, and thus it would be of interest to explore whether current PA (e.g. walking) was undertaken alone and particular barriers to structured forms of PA, including group activities. Given the low levels of health-reported quality of life, taking into consideration individuals' health needs (both physically and psychologically) would be important when designing and implementing any programme with the aim of increasing PA participation.

Limitations to this phase of the research study particularly pertained to the instruments used to collect data and the data collection procedures. The study used a convenience sample, plus some snowball sampling to recruit the 100 individuals receiving OST. Only a small number of pharmacies were used for recruitment and the location of these recruitment sites may have affected the types of people who were available for recruitment. In addition recruitment was dependent on staff at each pharmacy to make the initial approach to potential participants and so their relationship with their clients may also have influenced who was approached and subsequently agreed to take part. Those who were recruited through snowball sampling effectively self-selected themselves into the study and so likely had an interest in participating and possibly in PA, which may have resulted in a certain kind of response. Additionally the sample size used was relatively small, and so the findings cannot be generalized to the wider population on their own. Nonetheless, this study is the largest to date to attempt to quantify the PA levels of

individuals receiving OST. Again, although the sample size of individuals who participated in the pedometer study was small, limiting the significance and generalizability of findings, as well the nature of self-selection into the condition which may have introduced a level of bias, this was also the first study to explore the feasibility of using pedometers to measure PA in any population of drug users in the community. Self-report surveys as used to collect the remainder of the data in this phase also have their own limitations; inaccuracies in self-reporting can be caused by social desirability bias and recall bias. Attempts were made to verify the reporting of PA data through the use of pedometers and the subsequent qualitative phase of this study also provides an opportunity to explore the topics covered and verify or offer reasons for any differences found.

5.9 Conclusions

This phase of research has shown high levels of PA in a sample of individuals receiving OST and in a large number of cases exceeding current PA recommendations. Notably, PA was largely undertaken through walking, with limited participation in structured forms of sport and exercise. Despite these high levels of PA, low levels of health-related quality of life were found. Barriers to participation were identified, however further research is necessary to explore these barriers in terms of specific PA types and so the ensuing qualitative phase of research will aim to build upon the findings of this phase of research by adding understanding and meaning, as well as expanding on the topics covered here in order to gain a full understanding of the role of PA in this population.

Chapter 6

Qualitative phase: findings and discussion

6.1 Chapter introduction

This chapter presents the qualitative findings and discussion of this mixed methods study. Firstly the characteristics of the sample will be presented, followed by participants' experiences of their previous and current PA participation. The perceived barriers, enablers and benefits of PA participation will then be provided, followed by aspirations and goals for future PA. A discussion of these qualitative findings will then follow at the end of the chapter.

6.2 Qualitative objectives

As previously stated, the aims of this phase were:

1. To explore the previous PA experiences of individuals receiving OST
2. To explore the current PA habits and attitudes of individuals receiving OST, including both structured and habitual forms of PA, as well as time spent being sedentary
3. To explore the factors influencing PA and taking into account both structured and habitual forms of activity, in individuals receiving OST from a social-ecological perspective
4. To explore the future goals and aspirations for PA in individuals receiving OST

6.3 Characteristics of the sample

An overview of the key demographic characteristics of the sample are presented below in Table 11.

Table 11. Summary of the key demographic characteristics of the sample of 30 individuals

Characteristic	Frequency (n)	Percentage (%)
Gender		
Male	20	66.67
Female	10	33.33
Age		
18-29	5	16.67
30-45	17	56.67
46-57	8	26.67
Ethnic background	27	
White British	3	90.00
Other		10.00
Location		
City A	15	50.00
City B	15	50.00
Marital Status		
Single	17	56.67
Partnered	13	43.33
Employment Status		
Employed	3	10.00
Unemployed	27	90.00
Current OST		
Methadone	25	83.33
Buprenorphine	5	16.67
Current illicit drug use		
Yes	24	80.00
No	6	20.00
Current injecting drug use		
Yes	6	20.00
No	24	80.00
Self-reported physical health problems		
Yes	25	83.33
No	5	16.67
Self-reported mental health problems		
Yes	20	66.67
No	10	33.33

Note: percentages presented to two decimal places.

6.3.1 Biographic and socio-demographic characteristics

Thirty individuals receiving a form of OST participated in face-to-face semi-structured interviews. Of these, 10 had participated in the previous quantitative stage of the research project. Participants were recruited from the same two cities in Southern England as the quantitative stage, with 15 recruited from City A and 15 from City B. Twenty participants were male and 10 female, with an overall mean age of 39 years and ranging from 21 to 57 years old. The majority of participants were of a White British ethnic background with only three participants identifying differently (White European, mixed White and Caribbean and Middle Eastern).

Twenty-three participants were living in rented housing, largely in the form of flats at the time of interview. Housing was primarily in the form of council housing or housing association accommodation and 15 of these individuals were living alone. Of the remaining seven participants, six were staying with family or friends and one participant was homeless and had been staying in a hostel for the past six weeks. Many other participants also discussed periods of homeless in relation to their previous living situations.

Thirteen interviewees were either partnered or married at the time of interview. Twenty-one participants had children and of those 12 (n = 3 female) were in contact with their children, with just two (n = 1 male; n = 1 female) living with their children on a regular basis. The remainder saw their children to varying degrees ranging from most days to monthly and other frequencies in between. Given the age range of interviewees, the ages of their children also ranged widely. Several individuals had adult children who had gone on to have children of their own, while most had children under 16 with a couple of interviewees having children aged under one year old. Additionally, one female participant was also eight months pregnant at the time of her interview.

As well as their partners and children, interviewees also discussed their relationships with their wider family, including their parents and siblings, with many describing both emotional and physical distances between themselves and

other family members, often as a result of their drug use. However several participants also spoke of how their relationships with their family had improved as they had reduced their drug use and were living a less chaotic lifestyle. As well as relationships with family, interviewees also repeatedly discussed their friendships. For most their friendships were with people whom they had met through their drug use and who were currently still using drugs. For many this meant that they knew a wide circle of people, but regarded most as most acquaintances felt they only had a few so-called friends on whom they could really rely. However a third of interviewees felt that they had few, if any, relationships outside or their family/partner. This was often attributed to moving to a new location and in an effort to reduce their own drug use letting go of those people in their life who were still using drugs. This had left many isolated with little idea of how to make friends who were not using drugs. Many who were single described spending a large amount of time alone and isolation appeared an important topic in this group with many (partnered or not) expressing difficulty in meeting people outside of drug using circles.

For many individuals their pets were a big part of their lives. Twelve participants reported owning a dog and a further two participants had close family/friends with dogs that they regularly interacted with. Two further participants also had cats. When discussing their pets most interviewees were very enthusiastic and emphasized how important their pet(s) were in their lives and how much happiness they brought them.

In terms of education, a third of interviewees reporting having no qualifications and having left school at 16 or in some cases even earlier. Approximately half of those interviewed had achieved O-Levels/GCSE's, as well as several participants who had completed further education in the form of A-Levels or vocational qualifications. Two interviewees had undertaken higher education and completed university degrees. Only three participants reported that they were in paid employment at the time of interview. One interviewee was in full-time employment as a plasterer/brick layer and had been working in his current role for the past three years. Another male participant reported part-time work delivering food takeaways 3 or 4 nights a week. Finally, a female interviewee reported

selling the Big Issue sporadically. Therefore, for most participants their main source of income was in the form of state benefits. While discussing sources of income many participants also highlighted financial problems they were currently having. Most interviewees had some form of debts, with many struggling to pay their utility bills and the general feeling for most was that they were just about getting by with regard to the financial aspects of their lives.

Just over two thirds of participants reported having spent time in prison, including young offender and detention centres. Three participants were on bail at the time of interview having recently been released from prison. The time since their last prison stay varied widely amongst interviewees from the previous month to 25 years ago. A number of participants had been in and out of prison multiple times during their lifetime but when added together their total stay in prison also varied widely from under a week to an estimated 15 years.

6.3.2 Drug use

Twenty-four participants reported illicit drug use on top of their OST at the time of interview. The most widely used illicit drugs were cannabis, heroin and crack cocaine. Thirteen participants were using crack cocaine. Five individuals described their crack use as occasional, one used crack weekly and seven individuals used at least twice a week. Thirteen participants were using heroin. Six individuals used once or twice a month, three used two to three times a week and four were using heroin every day of the week. Nineteen participants were using cannabis at the time of interview. Nine of these individuals described their cannabis use as occasional – once or twice a month or less frequently. One participant was used cannabis two to three times a week, with the remaining eight individuals using daily.

In addition to crack cocaine, heroin and cannabis, one participant reported using amphetamines infrequently (two or three times a year) and two other participants reported sporadically taking benzodiazepines. Two participants were using cocaine sporadically. Fifteen participants reported that they were currently using

two or more illicit drugs. Twenty-four individuals reported having injected at some point in their lives, with six participants currently injecting.

Twenty-six individuals reported drinking alcohol, with 16 drinking on a daily basis. Of those 16, 14 felt that their alcohol use was a problem due to the amount they were consuming and the negative impact it was having on their lives. These participants all described regularly drinking over the recommended number of units of alcohol per week. Of the 14 who described their alcohol use as problematic, 13 were also using illicit drugs at the time of interview. Tobacco/nicotine cigarettes were regularly smoked on day-to-day basis by 28 of the 30 participants. Only two participants were not using any illicit drugs or drinking alcohol when interviewed.

6.3.3 Opioid substitution treatment

Twenty-five participants were receiving methadone and five were buprenorphine. Participants varied in the length of time for which they had been receiving their OST, ranging from nine months to over 20 years. Several individuals also spoke of having gaps in their substitution use and then returning to it again. The dosage of OST also varied amongst individuals, with a methadone dose range of 25 – 120 mg/day and a buprenorphine range of 3 – 32 mg/day Nearly all participants had previously been on different doses (both higher and lower) with some currently reducing down and looking to come off their OST and others being held at a constant doseage. Most participants collected their OST daily from a pharmacy, with a smaller number having bi-weekly or weekly pickups. A couple of women who found it difficult to attend the pharmacy because of health and mobility problems also reported that their partners would sometimes collect their OST on their behalf.

Those on methadone reported more dissatisfaction with their OST in terms of perceived side effects than those receiving buprenorphine. The most widely reported side effects on methadone were increased sweating that often made participants feel unwell and self-conscious as to the thoughts of others regarding their sweating. Stomach upsets and trouble sleeping were also frequently

mentioned. There were also wider negative views surrounding methadone, with many perceiving it as being 'worse' than heroin and more addictive. In comparison, the smaller number of interviewees receiving buprenorphine felt more satisfied with the medication frequently describing it as 'cleaner' and those who had previously received methadone spoke of noticing fewer side effects and feeling more 'clear headed', as well as generally better in themselves on buprenorphine.

6.3.4 Other forms of treatment for drug use

In addition to their OST, one participant was also attending a weekly Narcotics Anonymous group, with six other individuals having previously attended either Alcoholics Anonymous or Narcotics Anonymous, but no longer doing so. Four participants were also seeing counselors weekly or bi-weekly. In terms of previous forms of treatment, fifteen of the sample interviewed had also attended residential rehabilitation or detoxification services, with many having attended on more than one occasion. Most of those who attended these services reported leaving before the end of their expected treatment duration. Other treatments previously undertaken also included an outpatient detoxification programme, a day rehabilitation service and group work.

6.3.5 General health

When asked to rate their overall health most participants fell somewhere between 'OK' and 'very poor'. Their current health status was often considered in relation to the previous damage they felt they had done to themselves and that they either were not too bad taking this into consideration or it was to be expected that they would not be in the best of health. Nevertheless while they thought their health probably was not too good, a number of individuals spoke of how they had not had a recent health check from their GP and in particular were not sure how 'fit' they were, but would be interested to find out.

6.3.6 Physical health

Over half of those interviewed were receiving at least one prescription medication for a physical health condition; the main conditions mentioned being breathing related (asthma and chronic obstructive pulmonary disorder); musculoskeletal problems requiring painkillers; stomach problems; chronic conditions including diabetes and epilepsy; and anti-sickness tablets for morning sickness for one female participant who was eight months pregnant.

A further eight individuals reported some kind of physical health problem for which they were receiving no medication, leaving only five respondents who described no physical health problems. The degree to which reported physical health problems impacted participants' day-to-day lives varied greatly, ranging from very little impairment to their daily functioning to extremely limiting conditions for several individuals, requiring daily care from their partners and assistance when moving around; two female participants were both heavily reliant on mobility scooters as a way of getting around outside of their homes; one due to a previous leg injury and the other to neuropathy.

Aches and pains, as well as general feelings of fatigue were also widely reported, with many of those who were reducing their OST describing that they were now more aware of pain that had probably previously been masked by their increased opioid use. An increase in colds while reducing their OST was also highlighted, with several participants having just recovered from bouts of the flu at the time of interview. Many participants described feeling tired most of the time and for some the feelings of tiredness were so extreme it made doing anything in the day very difficult. These feelings of tiredness were attributed to a number of factors including health conditions such as Hepatitis C or side effects of medication they were taking. Fatigue was seen by many as a side effect of their OST, with those on methadone in particular highlighting feeling tired and generally unwell in themselves while on the drug. Participants who were now receiving buprenorphine but had previously received methadone, echoed this point and described how they now felt they had more energy and generally felt more clear-headed.

In terms of blood borne viruses, six participants had previously had Hepatitis C but had either received treatment to clear the virus or it had spontaneously cleared. Four participants currently knew that they had Hepatitis C and all were considering undergoing treatment but were worried about how grueling a process that would be. Those who currently had the virus described how they felt it contributed to their increased feelings of tiredness and lethargy.

Six individuals – both male and female – were concerned with their weight and expressed that they would like to lose some of this weight. All of these individuals were either overweight or heavily overweight and frequently referred back to when they had previously been underweight or very fit and were now very unhappy with their current appearance. For some their weight gain was so significant that it was causing them physical discomfort and making getting around a challenge.

One physical health problem highlighted almost universally by those receiving methadone as their OST was excessive sweating. Participants attributed this to their OST and described how the sweating could come on unpredictably, but be exacerbated by physical activity. The negative effect of sweating was two-fold, with it being both an uncomfortable and unpleasant experience physically as well making individuals feel very self-conscious and concerned about how others were perceived them. The amount of sweating was described as being profuse with individuals recounting that they had often been 'dripping' with sweat. In addition to the unpleasant physical sensation individuals felt that they were drawing attention to themselves and that it would be obvious they were a 'user'. These feelings resulted in a number of participants avoiding situations that they would be unable to leave if they experienced this sweating e.g. public transport, as well as taking preventative measures to deal with sweating should it occur e.g. carrying a spare change of clothes, or even resorting to buying new ones. Those participants who were now receiving buprenorphine but had previously been prescribed methadone, spoke of how they had experienced this problem on methadone, but no longer did on buprenorphine.

6.3.7 Psychological health

Two-thirds of participants were experiencing at least one psychological health problem at the time of interview. Depression and anxiety were the most widely reported conditions with fourteen and six individuals respectively reporting suffering from each. Other less frequently reported conditions included psychosis, bi-polar disorder, paranoia and schizophrenia, each by no more than three individuals. Ten individuals reporting psychological health problems were receiving at least one medication for a psychological health condition, with these medications being primarily for anxiety and depression, with a smaller number of individuals receiving anti-psychotic medication. Many other individuals who reported psychological health problems but were not receiving any medication and attributed this to a dislike of the side effects of medication that they had previously experience. Having difficulty obtaining prescriptions was also cited as another reason for lack of medication and two participants had resorted to buying Valium on the street. In addition to pharmaceutical forms of treatment for, three participants were receiving talking therapy for a psychological health problem – two were seeing psychologists and one was engaged in cognitive behavioural therapy.

6.3.8 Lifestyle factors – sleep and diet

In addition to exploring participants' general, physical and psychological health, two lifestyle habits associated with good everyday health were also briefly considered to give a broader view of participants' everyday lifestyles.

Most participants reported poor and often very poor sleep patterns, with broken sleep seeming to be a problem for many. On the other hand for some sleeping too much was a problem, particularly at unsociable hours e.g. going to bed in the early hours of morning and sleeping throughout the day. Boredom and a lack of activities to fill their day often meant that even those who were trying to stick to a more sociable sleeping pattern found themselves taking naps during the day. A smaller number of individuals reported insomnia and spoke of how they would be awake for several days at a time before 'crashing' and sleeping solidly for a day or

two. As mentioned earlier, fatigue was deemed to be a problem for many participants and poor quality of sleep in addition to poor sleeping patterns was also attributed to these feelings of exhaustion. For those who were able to sleep, vivid dreams, which were also referred to as 'night terrors' by some, often left them feeling traumatized upon waking and for several participants who had been reducing their OST and were now on very low doses, these dreams had become increasingly frequent.

In terms of eating patterns many described how their diet currently consisted of small portions of food due to their reduced appetites. Most were eating just one or two meals a day and several individuals would regularly go days without food. Nevertheless some participants were making an effort to eat healthily, with one participant describing how he grew his own vegetables on an allotment and did all his own cooking with fresh ingredients. For several other individuals it was important to eat regularly and healthily in terms of their health conditions, notably those with diabetes. The types of food eaten by most tended to be convenience and fast foods, but those living with family or a partner were more likely to be eating fruits and vegetables as part of their diet in addition to regular meals. Partners and family members were credited with cooking these meals in most cases. Several individuals who had recently reduced their alcohol use spoke of how they had noticed an increase in their appetite since reducing/cutting out their drinking and were now eating more as a result of this.

6.4 Previous physical activity participation

Before exploring participants' current PA habits, interviewees were asked about their previous PA experiences. For most there were two clear periods of their life within which their previous PA participation was framed – childhood and adolescence; and the commencement and continued use of drugs.

6.4.1 Physical activity during childhood and adolescence

Almost all participants reported having regularly participated in PA during childhood and adolescence. This participation included both habitual lifestyle PA

and 'always being on the go' to more structured forms of sport and exercise. Many participants reported participating in a range of activities, as highlighted by Chloe, age 44: *"When I was a kid I did ballet, tap, gymnastics, swimming, tennis. Everyday of the week I was doing something!"* The most frequently participated in activities included football, swimming, racquet sports, athletics hockey and rugby and took place in both school and extra-curricular settings.

In terms of sport and exercise participation, several participants, reported having competed to a very high standard – including both county and national level and spent a large amount of time training for their sports on most days of the week: *"I would get up at five o'clock in the morning, before school, go down to the swimming baths for six, swim till eight…and then in the evening about five, six o'clock go down the pool and stay there till half eight. That was my day everyday. I swam for the country against France, Germany, Belgium…"* (Marcus, age 41)

For both structured and unstructured forms of PA, two main motivators were cited as the primary reasons for participation – enjoyment and socializing. The enjoyment and pleasure participants experienced through PA was widely evident, with all of those who used to participate in regular PA looking back fondly on their experiences during childhood. The opportunity for socializing and spending time with both family and friends was also widely described, with many individuals citing family and friends as key reasons for their initiation of various forms of childhood PA. Only one female participant reported a dislike for all forms of PA during her childhood, which resulted in minimal participation, to the point where she would evade school PE lessons.

6.4.2 Commencement and continuation of drug use

While PA levels were high during childhood, as participants moved through their mid- to late-teens PA levels began to curtail. During this period for most this was when their drug use began, generally starting with cannabis use and progressing to include heroin and crack cocaine. As drug use began the general consensus was an accompaniment of a decrease in physical activity – particularly in structured forms of sport and exercise. This was attributed to a lack of interest in PA (and

often other hobbies and activities) and a new (and sometimes all-consuming) interest in drug use: *"Everything else takes a backseat. Your priorities change completely, food, family, friends, they all go on the back burner, you have to take care of your habit first of all. That's number one, it's a priority. Everything else, everything, gets pushed down the list of things to do"*(Gary, age 44). Additionally, just as PA during childhood had acted as means of socializing with family and friends, so did drug use come with a new social network, which often proved incompatible with PA. Carl, age 32, described this in relation to his football teammates: *"The friends that I had there didn't get into it [drugs], so I lost touch with them 'cause obviously they didn't want to hang about with me if I was doing it, 'cause they didn't want to do it…I started seeing them less and the ones that I did then hang about with weren't interested in football…"*

This decrease in/absence of PA was largely described in terms of structured forms of sport and exercise. However as interviewees' drug habits progressed the opposite was true of unstructured daily PA, with the overwhelming consensus being very high levels of active transport through walking and cycling: *"I'd be walking all day, from when I woke up to when I went to bed."* (David, age 31). As highlighted by Patrick, age 50, interviewees described spending a large amount of their time being physically active in order to fund and obtain drugs and that this activity was often performed with a sense of urgency: *"Running around looking for drugs, most of the time was spent looking for money to get drugs, you know, it just consumes your life, everything else goes by the by"*. This PA was not seen as a choice, but rather a necessity to prevent unpleasant experience of going into withdrawal: *"I didn't used to consciously make an effort to be physically active, although if was often necessary. You know I didn't necessarily want to be active, it was just something that I had to do in order to maintain the lifestyle I was living* (Matt, age 45)

Additionally for some, increased drug use also led to periods of homelessness and during these times walking was seen as way of keeping warm in bad weather and as something to do when to relieve boredom. Structured PA was still however far from participants' minds: *"I had too many things going on in my life to be able to cope with it [physical activity]. For one, if you're on the street you're not thinking*

of going to the gym" (Marcus, 41). While these high levels of PA were not viewed as positively as childhood PA, time spent walking with someone, even in the pursuit of drugs, was sometimes still viewed as a pleasurable experience. In addition a number of interviewees described feeling physically fit, despite their heavy drug use, something that was viewed as a positive outcome of such high levels of walking and cycling. During heavy drug us participants had often been aware of the many miles a day they were travelling, with a couple of participants even describing trying to measure how far they were walking through counting their number of steps walked per day.

6.4.3 Other opportunities for physical activity

As adults, around half of participants had experience of previously participating in other forms of PA, with their circumstances and environmental setting at the time providing an opportunity for participation. Types of PA mentioned included employment, prison and, rehabilitation services. For five male participants their previous employment had involved working very physical jobs, including lifting and being on their feet all day. These men perceived their previous manual employment as a source of PA that they had really enjoyed, had kept them fit and healthy as well as providing a sense of achievement: *" I worked on building sites, so I'd get exercise that way…It was good…getting something positive done"* (Michael, age 54)

Another setting for physical activity during adulthood for just over two thirds of interviewees were their prison stays. Both men and women reported using a gym while in prison and taking part in any other group PA on offer, as well exercising in their prison cells. All those who had experienced prison stays expressed their desire to do PA while in prison – in particular to use the gym. Even the one female participant who reported little interest during physical activity during her childhood and adolescence due to a disinterest in participation, attended a gym while in prison. Universally men and women both described boredom in prison as one of the main motivations for wanting to participate in PA in prison. Additionally men reported wanting to 'bulk up' during their stays, often comparing themselves to others in the prison and the need to 'measure up'. For

women, PA was also seen as a way to lose weight that was often gained in prison due to regular meals and reduced drug use. However several participants reported that access to the gym in prison could be difficult to gain and during short stays permission was often not gained before release.

Stays in rehabilitation services also provided an opportunity for PA. Activities offered included exercises such as yoga and running, as well as practical outdoor activities, involving gardening and building. While PA was not available or encouraged at every rehabilitation service attended, all participants who attended a service offering PA, reported enjoying that aspect of the programme, providing relief from boredom and the chance to participate in a meaningful activity. Zac, age 47, even described getting involved in the running of PA sessions where there was originally nothing on offer: *"If you are in there [rehabilitation service] for more than a week you get bored. So I got a little keep fit thing going…out on the lawn and did press-ups and sit-ups, jumping about, it was hilarious!"* While PA was generally viewed as a positive aspect of prison and rehabilitation treatment, there were instances in both establishments where individuals described detoxing and withdrawing from their drug use. During these periods of drug reduction participants often felt too unwell – both physically and psychologically – to participate in PA.

6.5 Current Physical Activity Participation

Moving on from participants' previous experiences of PA, participation at the time of interview was the next topic explored. Based on the findings of the quantitative stage of this project, which demonstrated a clear distinction in participation of habitual lifestyle PA and structured PA (with higher levels of the former), this section also sought to explore participation these two activity types.

6.5.1 Unstructured physical activity

Nearly all participants reported regularly walking on most days of the week. For most this was in the form of active transport and largely unplanned: "*It just happens, I don't think of it as a routine"* (Laura, age 51). Similar to previous PA

during periods of high drug use, walking was largely seen as a necessity when participants had little other choice, and an activity that sometimes had to be undertaken in less than ideal circumstances, as described by Holly, age 29, who was pregnant at the time of interview: "*I had to walk to my drugs appointment the other day, and that took like two odd hours to get there. And I had morning sickness as well, so having to stop along the way to be sick. And then walking back as well. I was in tears on the way back, because it's not just up the road…it's quite a way.*"

Despite walking on most days of the week, the amount of walking undertaken appeared to vary widely within the sample. Eleven participants reported walking distances of less than one mile on an average day, with many of these individuals reporting only leaving their homes to attend appointments. Sixteen individuals reported walking upwards of three miles on an average day, with three of these individuals estimating that they walked around five miles on an average day. Nearly all of those walking three or more miles a day owned a dog and described how walking their dog was a key motivator to walking longer distances: *"I definitely walk more since I've had him…seeing him going round in circles basically all excited about going out, that's kind of good motivation…he's my little therapy mutt really!"* (Chloe, age 44). Other reasons provided for walking included getting to and from appointments; funding an procuring drugs; visiting friends; not having enough to use public transport; and a dislike of public transport, in particular by those receiving methadone who felt uncomfortable due to excessive levels experiences on the OST. Only five participants also reported walking for pleasure and going out for long walks as an activity in itself rather than as a form of transport. Three female participants reported very low levels of walking, primarily only walking inside their own homes. These individuals reported spending a large amount of time inside at home, with two individuals largely using mobility scooters to get around due to mobility-related health problems.

As well as walking, eight participants reported cycling on a regular basis, with three individuals cycling on a daily basis to attend appointments and visit friends. However owning a bike also came with financial responsibilities, as one

participant reported borrowing a friend's bike as he was unable to afford his own; and another interviewee had been unable to use her broken bike for several months, due to being unable to afford to fix it. The three interviewees engaged in employment reported varying levels of PA as part of their jobs. One female participant sporadically sold the Big Issue and one male participant worked in a part-time role delivering in food which often involved climbing a large number of stairs per shift. Zac, age 47, who was working full-time as a plasterer described the highest levels of work-related PA, being engaged in physically demanding work all day for five or sometimes six days a week: *"It's very physical, plastering is a hard old job, it's hard work. I start off about seven thirty in the morning and finish at five...but God yeah it keeps you fit!"* Other forms of habitual, unstructured PA reported by older participants included gardening (two female participants) and the tending of an allotment twice a week (one male participant).

6.5.2 Structured forms of physical activity

Only five male participants reported that they were taking part in at least one form of structured sport or exercise outside of their home at the time of interview, with two participants regularly undertaking two different activities. Three participants reported having gone swimming in the previous week, with two of these individuals having only started going swimming weekly during the previous month. A third individual had been going swimming with his son once a fortnight for the past six months.

The two individuals participating in the most sport and exercise were both receiving low levels of buprenorphine which were they were reducing and expecting to come off in the very near future. One of these interviewees (who was living in a hostel), was playing competitive football for a football team aimed at including marginalized individuals on a weekly basis. In addition he also reported using a community gym one to two times a week. The other most physically active participant (the only participant in full-time employment) reported regularly playing squash once or twice a month, as well as spending a large amount of time mountain biking: "*I go [mountain biking] all the time, whenever I can. I get up early on Sundays and go out about five or six in the morning"* (Zac, age 47).

Three of the five male participants participating in sport and exercise outside of their homes also reported occasionally engaging in forms of exercise at home, including using dumbbells and a punch bag. One female participant was also participating in home-based PA in the form of physiotherapy exercises for an arm injury. However she reported not going the exercises as often as she should have been: *"I am doing my exercises for my arm…I should think it should be daily [how often she should be doing exercises], but to tell you the truth I do them only a few times a week"* (Rachel, age 57).

6.5.3 Time spent in sedentary behaviours

Aside from those interviewees who were employed, most highlighted large amounts of time spent being inactive on a daily basis. A number of individuals did report having interests but these were largely home-based and sedentary, including reading, knitting, drawing, playing the guitar, computers and video games: *"Watching television, reading a book you know…for a lot of hours a day. Ten hours or more probably"* (Harry, age 42). For most individuals boredom was a common theme and without any meaningful activities or structure/routine to their day many interviewees would also resort to napping throughout the day and would often not leave the house other than to attend the pharmacy or other appointment: *"Sometimes I doze off if I'm sat at home, because there is a lot of days where I won't even go out of the house and times when I will just go up to the chemist and that's it, I will just go straight home"* (Tina, age 57). Even participants who reported walking, cycling or participation in other activities, still described spending a large amount of their day engaged in sedentary behaviour.

6.5.4 Attitudes towards current physical activity participation

The overwhelming feelings expressed by the he majority of interviewees related to dissatisfaction and often frustration with their current PA participation. These feelings of discontent were most strongly directed towards individuals' lack of sport and exercise: *"I do a lot of walking about you know, but it's not structured or anything...I feel like I could always do more and I'd like to be involved with*

more people you know, badminton or something, activities that involve other people. I would like to do something like that" (Patrick, age 50). Participants also reflected on their current PA in comparison to their previous levels of activity, expressing unhappiness with both the types and amount of PA they were currently undertaking: *"It's frustrating for someone who spent most of their life running around. Physical exercise, 90% of my day would be used up by physical exercise, now maybe 10% is exercise"* (Lynn, age 35). While not as widely cited, frustration relating to unstructured PA was also apparent, particularly among those individuals with the lowest levels of PA, especially when various barriers existed preventing participants from completing everyday tasks, as Rebecca, age 28, described regarding problems with her leg: *"Oh it does my head in and sometimes I can't even walk down the chemist 'cause it's so painful and then I think I'm not going to get back home after this…it's really frustrating".*

Interestingly, participants largely felt that they were less active now than previously when they had been using drugs heavily and not on an OST: *If anything I'm less active now. I do go out for a walk once or twice a week and that's kind of structured, but not everyday you know, obviously I don't have to do that, so I'd say if anything I'm more inactive now that when I was using the drugs"* (Matt, age 45). The two participants with the highest illicit drug use and no plans to reduce this drug use, expressed indifference to their current PA participation. A third participant with no interest in being physically active expressed that he was happy with the low levels of activity he was currently engaged in, as he just disliked physical activity: *"If I could yeah I would avoid. If I have to do something then I will but if I have an option then I would choose not to…I've just got no interest in it."* (Carl, age 32). Only two individuals were content with the amount of PA they were participating in – the two male participants participating in the highest amounts of sport and exercise.

While feelings of dissatisfaction with current PA were widespread, for many participants' their attitude towards their current PA was not straightforward. For approximately a third of those interviewed these feelings of dissatisfaction went hand in hand with feelings that the amount PA they were currently undertaking was appropriate for them, given the wider circumstances of their current situation:

"I think for the moment I am happy with what I have been doing, because it's how I'm coping at the moment while doing cognitive therapy. When I come out of that I sometimes collapse in a daze, so for the moment I am happy with it…it's not my priority" (Jordan, 34). Additionally, aspects of enjoyment and feelings of well-being were described, even in terms of unstructured PA that wasn't necessarily being undertaken out of choice: "*Oh yeah, whenever I've been out and walked or cycled, I always feel better afterwards"* (Chloe, 44).

The next section of this chapter will present the perceived factors affecting PA participation in this group of individuals receiving OST. Factors affecting influencing PA participation were discussed in terms of both perceived barriers and perceived barriers to PA and will be presented as such below at the following four levels of influence: individual, social, physical environmental and policy-related.

6.6 Perceived barriers to physical activity participation

6.6.1 Individual-level

Health concerns – both physical and psychological – were frequently mentioned as barriers to participating in physical activity. Physical health conditions, of which both chronic and acute conditions were highlighted, were seen to limit individuals' abilities to be active in a number of ways. For some the physical limitation of the condition from which they were suffering meant that they were restricted in the type/amount of PA they could do without experiencing discomfort and pain. For example participants suffering from previous injuries, neuropathy as well as chest and breathing problems all spoke of their concerns regarding the pain of physical exertion. This was described by Rebecca, age 28, who had previously purchased a games console in order to try and perform PA at home using exercise and fitness related games: *"My leg kept seizing up all the time and I thought I can't be doing this. So I had to get rid of it, otherwise I would have carried on…once I'd done it I'd have to put my leg up for like an hour or two. Sometimes I felt like it would drop off, honestly".* The fear of aggravating

existing health problems by doing too much activity was also present, as was the fear of becoming ill during PA due to poor health/low fitness levels.

Lack of energy and tiredness were also cited as obstacles to being active. These feelings of fatigue were attributed to various causes including poor/lack of sleep, the medication individuals were receiving and as a result of other health conditions themselves. Tiredness was also linked to some of the psychological health problems which interviewees reported. In particular those experiencing feelings of depression reported that they often were not in the mood or the right frame of mind to want to be active. Others felt that they had so much going on in their heads that they could not focus or concentrate on trying to be active. Other more specific conditions were also seen as barriers to being active such as one female participant who would regularly experience bouts of agoraphobia and then be unable to leave her house for a week or a male participant receiving cognitive behavioural therapy, which he felt was particularly emotionally challenging and would leave him feeling drained (both mentally and physically) for several days afterwards and so felt he could not combine the treatment with also being physically active.

For those participants receiving methadone, the side effects of this medication were reported by almost all as barriers to PA: "*Being on a substitute – a lot of the way I feel physically is down to medication you know and that stops me…it is too difficult with the methadone when you are sweating unbelievably, just the though of it makes me sweat!"* (Patrick, age 50). Not only was the discomfort of sweating unpleasant, but it also caused concern for many individuals with regard to what others would think of them: *"I think the past, whether it be bullying or drugs, has made me very aware of myself and I think sometimes I see people looking at me and I think they're thinking things…so I create a bit of anxiety for myself…that they're probably thinking about me – oh my God I think she's a user or she has got the sweats she must be an ex-junkie – it definitely affects me"* (Holly, age 29).

A further issue was for those not maintained on a constant dose of OST, but reducing down with the aim of coming off their OST. Participants on both methadone and buprenorphine reported feeling both physically and

psychologically unwell each time their dosage was reduced: *"Maybe when I'm on less or down to nothing I might think about it, but at the moment all I'm worried about is getting off…'cause when I go down sometimes I feel a bit rough, on a steady amount I'm fine, but coming down not so much* (Carl, age 32). Feelings of withdrawal such as shivering and shaking had also been experienced by a couple of participants when undertaking, putting participants off being active while on their OST for fear of experiencing these symptoms.

A lack of self-motivation to be physically active was mentioned by over two thirds of interviewees as another reason for not participating. Many interviewees referred to themselves as lazy and linked their low motivation to extreme feelings of tiredness and fatigue. For some individuals their lack of self-motivation to be active was also linked to the current low priority of physical activity in their lives, with other factors such as their health and drug use/treatment taking priority: *"It's just like getting the motivation like you know its very hard to be motivated when you are taking drugs. It takes up so much of your life. It takes over your whole life completely"* (Oliver, age 49). Concurrently, a lack of motivation to be physically active also stretched into many interviewees' other hobbies and interests, with current lack of interest and purpose in any types of activity frequently described.

Also reported at the individual level was the impact of individuals' financial statuses on their PA participation. As described earlier most of the sample were unemployed, with state benefits their main source of income. An inability to afford entrance fees to leisure centres or attend group activities was widely as reported. Less frequently, participants' lack of disposable income meant an inability to afford suitable clothing to be active, which for Sam, age 52, was a potential source of embarrassment in relation to using: *"All I gotta do is get some kit…would be sort of embarrassed. They're all wearing Adidas and that"*. The financial cost of owning a bike was also reported as a limiting factor by several participants who enjoyed cycling, but were unable to afford/maintain their own bike.

6.6.2 Social-level

Social factors were cited as barriers to participation by the majority of participants and fell into two main categories: lack of support and encouragement and the lack of a physical presence of someone else to be active with. The issue of not having anyone to be active with was highlighted most frequently as a barrier to initiating a new PA behaviour with participants perceiving that it would be easier to go along once they had attended a number of times with someone else. The majority of participants described knowing very few, if any, people with whom they could be active with: *"I'd just like to play badminton again yeah. A couple of times a week or something you know, but I just haven't got the people to do that with"* (Patrick, age 50). For some participants their social circle consisted largely of other users, who were unsuitable exercise partners and uninterested in PA themselves. Other participants who were attempting to distance themselves from their previous drug-related lifestyles had also cut ties with their drug using contacts, however this had left a number of participants feeling isolated and unsure of how to meet new people: *"Just not knowing enough people really, 'cause the people I know are drug using and now I'm stopping I just don't know any people who don't use you know. I'm still trying to build that up…other times in my life I've met loads of people straight away, whereas this time I don't know many people."* (Nathan, age 32).

A common fear highlighted by several individuals was that if they attended structured activity, for example at a leisure centre, they would be the only person attending on their own and not knowing anyone else. Additionally PA was just viewed as being more enjoyable if it could be undertaken with someone else: *"I find it [swimming] harder when I am doing it on my own because I get bored so it's nice to have someone to have fun with you know"* (Marcus, 41). Given the lack of social networks and increased isolation reported by participants it was not surprising that most individuals also described a lack of encouragement from others to be physically active. Family, friends, health professionals and drugs workers were highlighted as individuals with whom some interviewees had regular contact with and yet for the most part the topic of PA was not discussed:

"I need someone to prod me I really do…I certainly don't have the support." (Rachael, age 57).

6.6.3 Physical environment-level

Barriers to participation at the physical-environmental level were the least widely raised, nonetheless several issues still had a bearing on some participants' PA levels. For several individuals the safety of their environment was of concern, resulting in them not leaving their homes after dark and in two cases being fearful of leaving their house at all. These fears were due to previous assaults on them in their neighbourhood and were highlighted by both men and women: *"If I am in a good environment and in a good area I would prefer to come out you know and walk and this when outdoors you know in the park and using it, but that place because it is not safe and I can't do anything I just prefer to stay home and keep quiet"* (Ed, age 38).

The types of physical activity facilities available in individuals' local environments were also seen as limiting attendance. Specific forms of discontent related to the lack of cleanliness of facilities and the run down appearance of venues. These judgements were often based on participants' previous experiences of superior facilities: *"It might sound a bit snobbish but I was very much a product of middle class fairly elitist public school and used to having nice facilities"* (George, age 50). The proximity of facilities was also a problem for some, with limited transportation options to travel to said facilities. Seasonal variations and the weather also affected participation. Participants reported being more likely to go outside during the summer months and on days where the weather was good: *"I might think of visiting a friend on the other side of town and I'd think no it's a bit far, especially if its raining or freezing cold or whatever you know. That can be a bit restricting, whereas a few years when I was using the weather wouldn't have come into it. If you needed to go somewhere you would just go. You wouldn't think twice."* (Gary, age 41).

6.6.4 Policy-level

At a policy level several barriers to participation were raised. Differences in PA schemes between recruitment locations were evident. In City B individuals in treatment were able to attend a gym for free on a scheme specifically targeting individuals using a particular drugs service. In City A some participants were aware of a scheme in their area whereby they could use facilities including a pool and gym at a reduced cost designed for those on low income. Many participants expressed unhappiness at the limited range of activities that they knew of that might be accessible to them and in City B where the free activity on offer was gym-based: *"I know there are people that like gyms, but its just not for me…if it was to go and achieve something to me…to do something constructive."* (Patrick, age 50). The health and mobility problems of some participants also resulted in dissatisfaction with free gym use being the only activity on offer: *"I wish I could get a pass to go swimming…it's all gym and I can't do that"* (Tina, age 37).

Only a small number of individuals had taken advantage of the free gym use scheme and at the time of interview no participants were attending. Additionally two individuals reported negative experiences, which had resulted in them not returning. One had felt embarrassment due to the obvious nature of her free use and the card that she was required to show on arrival that set her apart from members of the general public and the other found the activity setting unpleasant: *"I felt really uncomfortable. I thought you just joined the gym and got a free pass…what I didn't like about it was how personal it got they want to weight you, they want to know this, they want to know that. I don't want that. It felt like too much pressure"* (Gary, age 41).

In addition to dissatisfaction with the types of activities offered in schemes targeted towards them, there was wide variation among participants as to their knowledge of the existence of these schemes. Some individuals were unaware of the presence of any low cost or free activities: *"I just don't know what's out there really, that you can join or do you know…I've not seen any information on anything and I wouldn't have a clue where to go looking either"* (Patrick, 50). There was also variation between individuals as to where they had found

information on the activities on offer to them, with most information coming from friends. As well as uncertainty regarding activities on offer, for some participants, particularly those with limiting health problems, a lack of knowledge and information on what activities they could safely do was also absent: *"All the information is what you should be doing and its like well how do you expect me to do that when I cant even walk you know a mile or half a mile…I just think If I knew more about what I could and couldn't do…well I know what I can't do."* (Rebecca, age 28).

Many participants felt there was not enough PA on offer to them and individuals on OST. Two female participants described activities that they felt were on offer to other groups, but not them: *"You get certain groups for disabled people, but I don't really wanna do that…I wanna do it with people that are able-bodied"* (Holly, age 29) and *"They'll whack you on methadone, they'll give you as much as you want but they won't give you anything that helps with that [lack of social network]. If you go to AA there's a lot of people and they do activities together. But what are we meant to do? They do surveys now and again, how good is your doctor or drugs worker? But there's no ideas coming forward arranging things."* (Tina, age 37).

6.7 Perceived enablers to physical activity

While the previous section of this chapter outlined numerous barriers to physical activity participation, participants also suggested a number of enablers to PA participation, with both actual and perceived enablers highlighted.

6.7.1 Individual-level

Just as health limitations were seen as a major barrier to PA participation by many of the sample, it was not surprising that improved health was widely perceived as a prerequisite to increasing participation. Participants felt that their health – both physical and psychological – was so poor that in their current state they were unable to do any more than they were already doing: *"If I had sorted my health*

out a bit I'd go along to things, but yeah at the moment it's just like I'm not going to say yes to that because I just couldn't do it." (Harry, age 42).

For those individuals who were engaging in sport and exercise on a regular basis, having a routine and scheduling in their activity into their day, as well as making the activity a priority were seen as an important enablers. Similarly, regular appointments with GP's, drugs workers and at pharmacies, were cited by many as facilitators to physical activity in the form of active transport. Without these regular appointments many felt that on a number of days they would not have a reason to leave the house and therefore would spend the day engaged in largely sedentary activities. Having appointments gave most participants a reason to leave the house on nearly everyday of the week. Having a dog was seen as an enabler to PA by half of participants who currently owned or knew of someone close to them who had a dog. Holly, age 29, emphasized that while there were times she did not feel like going out and would not have just for herself having a dog meant that she had to: *"You have to go walking you know, because of the dogs and they tie into that activity. So walking is the main activity for me…in a way it's a Godsend he gets me up and out"*.

They type of OST received by participants was also viewed to impact upon PA participation, with those receiving buprenorphine feeling that the drug allowed them to be more active. Having been on methadone previously two of the five individuals receiving bupreophine spoke about how they now feeling better physically as well as being more clear-headed made it easier for them to be active: *"I feel better physically and mentally. My body doesn't feel like its been battered every morning and it doesn't make you feel so tired it makes you feel more lively"* (Lynn, age 35). The absence of excessive sweating as experienced on methadone was also a large positive of buprenorphine treatment. As well as OST type, illicit drug use also served as enabler to PA. Similar themes emerged to those discussed in relation to previous PA, with those participants who were using heavily spending time walking (and sometimes cycling) in order to fund and procure drugs.

6.7.2 Social-level

Along with having improved health, the most frequently highlighted enabler to PA was increased social support, primarily in the form of having someone to be active with but also as encouragement – particularly verbal encouragement. Active and non-active participants identified similar social enablers, including having important others (e.g. friends, family, health care providers) encourage them to be physically active and having someone to be active with. Those who were active and engaging in structured sport and exercise reported having support and people to be active with, whereas the less active individuals did not have this type of support, but strongly desired it Many of those not participating in sport or exercise highlighted the importance of having someone to be active with – particularly when going along to something for the first time*: " [friend] said lets do something every Wednesday, so I went yeah and that was it, we started having a game of squash. I dunno, I think it was him really that got me into squash, or back into squash should I say."* (Zac, age 47).

While many participants described not receiving support or encouragement in relation to PA from others in their lives, for those who had received support, this had made a difference. This was evidenced by Ed, age 38, whose pharmacist had had suggested a walking route to get him out of the house: *"[pharmacist] is telling me a lot, because you know I'm a bit depressed and I gone where he told me I just used to walk to the same place. I just walked this route and come back home and feel much better."* (Ed, age 38). Social support was not only seen as an important enabler to initiating activity, but also in regard to maintaining activity behaviour. Having someone else to be active with was perceived as more enjoyable and therefore individuals felt they would be more likely to sustain participation. Wanting to be more active to support and take care of family members was also reported, as well encouraging others to be active themselves. Holly, age 29, who was eight months pregnant when interviewed felt that the imminent birth of her child was large reason for her to become more active and she had begun looking into parent and child swimming classes: *"It might be awkward or uncomfortable, but I couldn't have a better reason to do it now."* Another female participant spoke of how she and her husband had acted as forms

of support to enable a friend, also on OST, to become more active: *"Me and my husband paid for him to go swimming. And we can't afford to do it. But to get him doing exercise, someone should help him because he really does not have the money"* (Lynn, age 35).

6.7.3 Physical environment-level

The only perceived enablers highlighted relating to the physical-environment were related to the location of housing and facilities. A couple of individuals mentioned having tried to move location, as they felt unsafe in their current area, however they had had no success with this. Additionally a couple of individuals in poor health and expressed wanting to go swimming but found it difficult to get there, living the other side of the city from the only swimming pool: *"Oh yeah definitely I'd do it a lot more. If someone said I'm quite happy to come and pick you up, I'd say maybe not every day but how about you go three times a week swimming, I'll pick you up and I'll drop you there but you make your own way back. I'd be more than happy to do that. I'd be well chuffed."* (Max, age 43).

6.7.4 Policy-level

The availability of free activities was seen as important to this group. The importance of free versus low cost was emphasized by many due to their lack of disposable income and the often chaotic nature of their lives, which meant that even if they had money to attend one week they would not be able to guarantee the same the following week: *"It being free would make a big difference. 'Cause money is an issue living like we do. You can go from having five grand a day to having 50p a day and people gotta live like that. You can't rely on having something one day and not the next. I don't know whether I'm eating tomorrow let alone whether I could pay and go do something."* (Tina, age 37)

While some individuals were aware of free activities offered in their area – this was primarily limited to gym-based exercise – which for some was unappealing and in addition for others perceived to not be feasible due to their mobility problems. Having a wider range of free activities on offer to cater to individual

preferences and needs (i.e. health limitations and requirements) was also seen as an important step in facilitating increased participation in PA. Access to swimming pools in particular, was highlighted as an activity that if it was on offer, would be utilized by many individuals.

Also, PA programmes that took into account participants' current life situations were seen as important enablers to PA. This included aspects of flexibility, accommodating that individuals may not always be able to attend sessions as well as achieving a balance between receiving guidance and being left to themselves, without feel pressurized or that an instructor was constantly breathing down their necks. The flexible nature of the football team played in by was highlighted as an important aspect of his continued involvement: *"A few weeks ago I wasn't really turning up…my coach knows what's going on. There's no pressure on you they understand"* (Oscar, age 23). Information on the activities available in their local area, including the activity type, activity cost, location of activity and who would be attending and leading said activity was also desired. Most participants felt that receiving more information, particularly in person would be ideal– through individuals and services they were regularly in contact with, such as GP's and drugs workers – but realized that services often busy and written information to take away and look at in their own time would also be useful: "[*Professionals could inform you or talk to you about it, but also like a leaflet with information would probably help 'cause if you had phone numbers and timetables and addresses, where's the nearest and how much it cost, what's down there, swimming or weights, whatever? You'd be alright to do it when you felt like it sort of thing"* (Scott, age 44). Additionally individual-based information and advise in relation to specific health conditions and the safety of undertaking PA was also viewed as a potentially enabling factor in increasing individuals' confidence to be active.

6.8 Perceived benefits of physical activity participation

All 30 interviewees were aware of the health and social benefits of PA. Participants were aware of the general benefits of being physically active, as well as discussing personal perceived benefits and benefits they had felt when they were previously active.

Participants identified perceived physical and psychosocial benefits of PA. When discussing the potential benefits of PA participation many individuals also differentiated between the immediate benefits of taking part in an activity and the more long-term benefits resulting from regular participation. Immediate benefits included the calming benefits of physical activity and using it as a release to cope with feelings including anger and anxiety. Immediate feelings of enjoyment and the buzz from participation were also highlighted. More longer term benefits discussed were health related – improving health and weight, distancing from their old lifestyle, sense of achievement, getting out of their comfort zone and developing a new routine and using their time effectively.

The most frequently perceived benefits were improving health (both physical and psychological) "*It gives you a healthy mind and all that yeah. Healthy body and stuff too"* (Nathan, age 32) and meeting new people, as highlighted by Rachael, 57, *"It would be not to be trapped in the flat, so I want to go out and see people. The main reason is company. The second is health."* The role that PA could play in meeting different kinds of people, unrelated to drug use was also a common theme: *"I mean half the problem trying to get off drugs is that you have to cut your peer group off you know, so the only way you are going to make new friends is by doing that sort of thing [physical activity]"* (Tina, age 37). The only participant playing competitively on a football team described the sense of achievement he felt from winning something and that he could achieve something*: "It helps me a lot and playing as a team takes my mind off things…and you're part of something, when you're winning and you get trophies and it makes you feel that you achieved something…like last year I got about five medals and it made me feel really proud, really good in myself and that I can achieve something"* (Oscar, age 23).

Related to drug use, nearly all participants felt increased participation in PA would take their minds off drugs, putting distance between their 'old self' and 'new self' by replacing old negative activities with new positive ones. This sentiment was highlighted by Zac, age 47, the most active participant sampled: *"the more things I do that are positive and healthy, the more distance I feel from my old life."* The filling of time with meaningful activity and relieving the boredom that was a part of many individuals' lives, as well as enjoyment and a natural buzz was also a common theme both for all participants: "*If you take heroin out of your life, well that's got to be he biggest endorphin buzz you will ever get so the only way to put it back in is to get an exercise buzz…just tray and feel a little bit high on life really"* (Zac, age 47)

Those participants who were most active, particularly through sport and exercise tended to describe benefits in the present tense, whereas those who were less active or just engaged in walking, described the potential benefits of increased activity. The perceived benefits of PA were similar across all participants, whether they were active or not.

6.9 Aspirations and goals for future physical activity participation

Twenty seven of the thirty individuals interviewed reported wanting to do more PA in the future, with increased participation including both more time spent being active as well as participation in a wider range of physical activities (namely structured sport and exercise) than they were undertaking.

Participants' PA aspirations were generally of a modest nature, comprising of the resumption of previous physical activities and as well as having the opportunity to try new activities. All those individuals wanting to be more active described wanting to gradually build up their activity, starting slowly, with many feeling that due to their current low levels of activity they would probably be quite unfit: *"I'm not ready to use a gym, I need to build up slowly then see how I'm doing…I have not done exercise for a long time, need to slowly build up and then get more* (Ed, age 38). Participating in an activity two or three times a week was generally

seen as a good level of participation, allowing individuals to incorporate more structure into their lives and to have activities planned to fill in the free time that would be available once they were no longer using drugs: *"I would actually kill to have something to put my head into to stop me getting so bored and thinking about anything else…I'm desperate for bits and bobs to put my head into."* (Tina, age 37).

In addition to being open to try a variety of activities, specific activities were frequently mentioned by a number of interviews, those most frequently highlighted as desirable for future participation were swimming and using a gym, often influenced by what participants' perceived they were able to with certain health problems: *"Swimming I suppose is less stressful and water helps keep you up, that would be the most sensible and pain-free exercise, 'cause I struggle with everything"* (Rebecca, age 38). Getting back to previous physical activity levels through participation in these activities was also desired. *"[In an ideal world] that's quite easy actually, 'cause I would probably be exercising the way I used to...I used to be physically able to do so much stuff."* (Lynn, age 35).

For those with children activities they could do with their children were also appealing and important, with nearly all of those with children highlighting their desire for their children to be active: *"I will try to encourage her as much as possible and get her enjoying it from as early age a possible and I think for the foreseeable future a lot of my activities will be revolving around her"* (Holly, age 29). For five male participants a physical job was also important to them when considering their future aspirations. Returning to work was also viewed within a larger aspiration of 'normality': *"Just getting up, going to work. Just being normal, what the everyday Joe Bloggs does"* (Harry, 42). The view that PA would contribute to an ordinary lifestyle was echoed by most participants in some form or another: *"I'd love to just go out and exercise and walk around like a normal person"* (Lynn, 35).

Participant responses highlighted varied aspirations regarding the setting of future physical activities and in particular the social setting. There was a divide between individuals as to whether they would prefer to be active alone, in pairs, small

groups or large groups, however the general consensus was towards pairs and small groups: "*Individual rather than a group…but by saying individual doesn't mean I wouldn't want to do anything with other people, but it would be individual in the sense of a squash game, where there is two of your competing against the other, rather than a large group of people on a football pitch"* (George, age 50) and *"I'd like a small little group…because when you're doing sport a group's important to encourage each other sort of thing"* (Harry, age 42). A concern for some interviewees was also having active drug users attending groups as they wanted to stay away from individuals who were using to avoid temptation to use themselves *"I would try to avoid recovery – mixing with other users – I don't want to be around that sort of thing and I certainly don't want my baby to be around that sort of thing. If it was with a group of users I would be inclined to not go at all…that would put me off more than people I had never met before"* (Holly, age 29).

In addition to PA participation, three interviewees expressed a desire to be involved in the coaching/leading of physical activity groups, with one individual having previously attempted to set up a mountain biking group for young people living in difficult circumstances, however he had been unable to secure any funding for the project. These three participants described wanting to give back as they themselves had received a large amount of help, relating to their drug use and other life issues and also to serve to deter young people from getting involved in drugs and leading a life similar to theirs: *I see myself having my own team being a coach having lots of training…I've already done my first coaching course"* (Oscar, age 23).

While most interviewees did have aspirations regarding increasing their activity and a desire to be active, almost no participants were taking any direct steps to increase their PA. The exception to this was Holly, 29, who had recently purchased a specific type of pushchair so that she would be able to do more walking once she had had her child she was pregnant with at the time: "We got a buggy *with a five year guarantee so we intend to use it! It's a big firm chunky buggy so should be able to cope with lots of walking."* Additionally Holly had sought information on parent and child swimming groups from her midwife.

6.10 Discussion of the qualitative findings

The qualitative findings of this study echoed those of the quantitative phase, in that participants were primarily undertaking PA in the form of walking, with low levels of participation in structured sport and exercise. Additionally, the use of qualitative data collection allowed for the exploration of factors influencing participants' PA habits, including activity and choices and levels of activity. In line with the social-ecological approach used to frame this further understanding of PA, influences on participation were reported at the individual, social, physical environmental and policy levels of influence.

In further agreement with the existing research of Neale, Nettleton and Pickering (2012) and Fischer et al. (2012) among drug users, as well as the quantitative findings of this study, walking was the most widely participated in form of PA by this sample of individuals receiving OST. While this qualitative data is not able to quantify levels of walking, participants' descriptive accounts suggested variation within the sample, with over half reporting walking three miles a day or more and just over a third walking less than a mile on a typical day. As found by Neale et al. (2012), walking in this sample was largely undertaken as a form of active transport (rather than walking for pleasure) and was used as a means of getting to and from appointments, collecting OST, travelling to fund and obtain drugs and visiting friends. Not being able to afford to own a car or regularly take public transport meant that walking was the main form of transport for this group. Having a dog was also a key aspect of many participants' walking levels, with over a third of the sample owning at least one dog and taking their responsibility of caring for their dog(s) and ensuring they were exercised regularly.

Participation in sport and exercise was low and primarily only undertaken by male participants, in line with data from the general population that men are more active in leisure activities than women (Health and Social Care Information Centre, 2014). Additionally almost all of the sample described spending long periods of time each day engaged in sedentary behaviour, a risk factor for poor health independent of physical inactivity (Thorp et al., 2011) and a key aspect of current UK PA guidelines (Department of Health, 2011). A lack of meaningful

activities to fill the space individuals' lives created by reduced/less chaotic drug use on OST; poor health; and reduced social networks were largely credited for the high levels of time spent sedentary.

While current levels of sport and exercise were low, data gathered on participants' previous PA participation found high levels of engagement in a variety of structured forms of PA. In reference this previous participation which had been very enjoyable, the sample overwhelmingly described feelings of dissatisfaction in regard to their current PA participation, regardless of how active they were through walking, in that they would like to be undertaking more sport and exercise activities. While many participants were still walking several miles a day, these levels were generally perceived to be less than when participants' drug use was heavier/more chaotic, as there was no longer a 'need' to be active in relation to their drug use.

Barriers to PA participation were reported at multiple levels of influence and in order to go beyond the quantitative phase findings these barriers were considered in terms of both structured and unstructured PA, rather than just PA as a whole. In terms of structured sport and exercise, barriers to participation were reported at the four levels of consideration: individual, social, physical environment and policy. Given that many of the sample were regularly walking, unsurprisingly less barriers were reported to walking, occurring largely at the individual level, with a few physical environmental barriers. A wide range of health conditions and concerns were present in this sample, including some issues specifically related to drug use and OST. For those with particularly poor health, this acted as a limiting factor to all PA. For others, limitations were in regard to different activity types, with restrictions on the amount of PA they could undertake without experiencing negative effects. Additionally, a lack of self-motivation as well participants financial limitations were widely emphasized as barriers to sport and exercise participation.

Along with poor health, social level factors were the most frequently discussed barriers to participation, however these barriers were exclusively discussed in terms of structured forms of sport and exercise, rather than unstructured activities

such as walking for active transport. A lack of other people with whom to be active was of particular concern in terms of initiating participation and linked to their drug use, many participants' social circles consisted of other individuals who were using drugs more chaotically or they were in fact quite isolated having cut ties with their drug using contacts and so knew very few people at all. For those individuals who were in regular contact with other people, there appeared to be limited discussion relating to PA and encouragement to be active. Existing research in drug users (Neale, Nettleton and Pickering, 2012) as well as other populations (Bauman and Bull, 2007) has highlighted the important role of social support on PA participation.

Increasing evidence has pointed towards the role of the physical environment in influencing PA participation, while this was perceived as a barrier in this study; it was the least widely cited level of influence. The neighbourhoods that individuals lived in appeared to influence both unstructured and structured PA, in terms of safety concerns and proximity to sport and exercise facilities. Furthermore, the type and quality of facilities available also influenced participation. At a policy level, differences were apparent in the presence of schemes and strategies involving PA and this population in the two recruitment locations. Knowledge of PA schemes varied between individuals, but participants were generally unhappy with the limited types of PA available to them for free or at a reduced cost, which were largely gym-based. A dislike for gym-based PA as well as an inability to use a gym due to health restraints were among the reasons cited for this unhappiness. This dissatisfaction of limited activity type echoes the feedback from older drug users involved in the feasibility study of gym-based exercise referral (Benyon et al., 2013). Limited information on PA as well as health-related information in terms of what individuals could safely do, not just what they should be doing, were also seen to inhibit activity.

Just as barriers to PA participation were identified at multiple levels of influence, so were perceived enablers to aid participation. Notably perceived enablers were largely discussed in terms of aiding participation in sport and exercise, perhaps understandably as over half of the sample were already undertaking walking on a daily basis and these were the desired activity types individuals wanted to be

undertaking more. Of all the factors influencing future PA, improved health was viewed as the most important individual factor and as prerequisite for increasing PA. For those with the lowest levels of total PA, improved health (both physical and psychological) was seen as a perceived enabler to increasing participation in both structured and unstructured activities. Those participants participating in sport and exercise reported few significant health problems and the most active individuals were receiving an OST in the form of buprenorphine, reporting fewer side effects compared to methadone. In terms of active transport through walking, factors relating to individuals' drug use were seen as facilitating factors, including the need to fund and obtain drugs, having appointments to attend and limited disposable income which forced to participants to walk rather than take public transport. Ownership of a dog was also seen as a big enabler to undertaking regular walking, reflecting existing research into the positive relationship between dog ownership and increased walking levels (Cutt, Giles-Corti, Timperio et al., 2008).

For those participants engaged in sport and exercise, social support had been a key enabler to activity, particularly in having people to be active with. For those less active, this was viewed as a potential enabler to participation as was increased support and encouragement. While there were few examples of participants receiving support and encouragement, there was evidence to suggest that this also played a role in helping individuals both start and maintain PA participation. Linked to support assistance in overcoming physical environmental barriers relating to distance to sport and exercise facilities were also desired by some participants, depending on their level of mobility and location of housing. At a policy level, the availability of a range of free activities was desired, in line with the findings of Benyon et al. (2013) in relation to exercise referrals in gym-based activities in a group of older drug users. The flexibility of attendance at activities as well as unpressurised instruction was also seen as important and perhaps a reflection on the unstructured lives of many participants. Information on PA availability as well specific information in relation to readiness to exercise was also raised.

All participants were aware of the health and well-being benefits of being physically active, supporting the data gathered through the use of the EBBS in the quantitative phase and data from US methadone users (Caviness et al., 2013). Perceived health benefits were widely reported, as per the EBBS, along with increased social interaction. Both of these aspects were highlighted in the demographic data collected, with individuals reporting a number of health problems and often diminished social networks. Benefits were often linked to factors relating to drug use, such as improving health in relation to the damage done through drug use and meeting new people who did not use drugs. Just as many participants reported spending a large amount of time engaged in sedentary behaviour not that their days were not occupied through drug use, participation in PA and particularly sport and exercise was viewed as a way of filling in this time with a meaningful activity, that distanced themselves from their previous drug use. Similar benefits were highlighted by participants regardless of their activity level, with those who were more active reporting achieving some of the benefits that less active individuals desired. Quantitative findings demonstrated a small significant positive correlation between total energy expended through PA and total EBBS score, with the more active participants viewing PA more positively. Qualitative data suggested that all participants were aware of the benefits of PA, regardless of activity level and so more research may be required in order to understand the value of information in terms of knowledge of the benefits of PA in facilitating PA in this population.

For the most part, the sample described dissatisfaction with current their PA participation. Most of the sample wanted to participate in increased amounts of sport and exercise, with some of those with the lowest amounts of PA wanting to be more active in all parts of their life. However, almost none of those wanting to participate in more sport and exercise described currently taking any action to increase participation. This ties in with the complicated feelings participants expressed towards PA and particularly sport and exercise, that while they were unhappy with their current levels of participation, due to a number of negative circumstances in their life (as mentioned through barriers) they felt unable to change their participation at that time. As mentioned one advantage of social-ecological approaches to understanding behaviour, is the ability to draw on other

models and frameworks at the various levels of influence explored to aid understanding. The Transtheoretical Model may provide useful guidance in the targeting of different strategies to increase participation in sport and exercise in this sample, in relation to appropriately targeting interventions to different groups, based on their position in the stages of change. The successful implementation of the stages of change dimension of the TTM was demonstrated by Williams (2003) in a group of drug using offenders in matching individuals to a PA intervention.

In terms of the use of a social-ecological approach to exploring and understanding the factors influencing PA among individuals receiving OST, this appears to have been useful approach and in line with the four key principles of social-ecological approaches highlighted by Sallis, Owen and Fisher (2008). In agreement with the first principle, findings in this study highlighted the multiple influences on behaviour at various levels of influence. Secondly, influences on behaviour interact across these levels, as was the case in this population with factors influencing PA not being isolated from one another. For example in terms of barriers to PA, factors related to OST and drug use were highlighted at the individual level linked to health problems, lack of motivation, other priorities; at a social level, isolation or networks not interested in PA; at a physical environmental level the areas in which individuals lived; and at a policy level the types of strategies and initiatives aimed at this group. Thirdly, approaches should be behaviour specific when identifying relevant influences; and wider range of influences were found in this sample in relation to structured forms of PA than unstructured. Finally, it is posited that multiple level interventions should be most effective at changing behaviour. Implications from this study indicate agreement in taking a multi-level approach for increasing PA and specifically structured PA among individuals receiving OST.

In terms of the implications of the findings of this research there does appear to be a need (and desire) for increased strategies enabling individuals receiving OST to increase PA participation, particularly through participation in structured activities. Future research is required to explore the effectiveness of strategies to enable this group to overcome perceived barriers to participation and findings suggest that these strategies may need to consider the multiple levels of influence

on behaviour. In the context of UK drugs policy relating to this population, increased participation in structured forms of PA ties in with the attention directed towards the wider aspects on individuals' lives during recovery, including the participation in meaningful activities within their communities contributing to improved well-being and quality of life.

While this study has provided insights in the PA experiences of individuals receiving OST in the UK, the findings should be interpreted within the context of their potential limitations. Most participants were White British and while this is reflected of individuals receiving OST in the UK, it is worth noting that different themes may have been present with individuals from different ethnic backgrounds. Additionally convenience sampling was used to recruit participants and some participants who had participated in the quantitative phase also participated in this second phase. Thus the issue of sampling bias in terms of those recruited and their attitudes and experiences of PA way influenced the research findings.

6.11 Conclusions

This phase of research suggests that individuals receiving OST are interested in PA and are primarily active through walking in the form of active transport. Participation in structured PA is much lower, despite a keen interest from many individuals to be participating in sport and exercise. Barriers were perceived by this group at individual, social, physical environmental and policy levels in terms of increasing PA participation. As a group who reported concerns in relation to physical and psychological health as well as other aspects of quality of life including social belonging and meaningful activities, increased participation in sport and exercise may provide a way of contributing to these areas of individuals' lives in line with current drug policy and highlighted by existing literature involving PA interventions incorporating sport and exercise into drug treatment programmes. Findings suggest that strategies to increase PA in this group may need to be multi-level, with further research required to explore the effectiveness of potential strategies.

Chapter 7

Discussion and conclusion

7.1 Chapter introduction

This thesis sought to explore PA participation among individuals receiving OST for illicit opioid dependence. As highlighted in the introductory chapter a number of harms are associated with opioid dependence and in the UK, where OST has become established as the main treatment form. However research has largely focused on the effectiveness of OST in reducing the more harmful concerns associated with opioid dependence and less on the everyday lives of individuals. Additionally, recent changes to UK drugs policy have advocated a move to a recovery-based approach, including attention on the wider aspects of individuals' lives, which may contribute to recovery. As such, there is a rationale for examining the everyday lives of individuals receiving OST and one are in which there is very little data is their PA habits.

Chapter two outlined that numerous benefits of PA participation have been found, including physical, psychological and social health benefits to the individual, as well as wider benefits to communities and society. In terms of PA and drug use, literature was presented in terms of two strands of exploration: PA interventions as part of drug treatment programmes and PA in the everyday lives of drug users. In research exploring the use of PA as an intervention, benefits similar to the general population were found, with additional benefits related to drug use including increased retention in treatment and reduced risk of relapse. In terms of everyday PA, most literature suggested that drug users are interested in PA and again cite a number of benefits of participation. Only three studies had attempted to quantify PA levels, two of which found high levels of PA primarily through walking and a third examining individuals receiving methadone reported low levels of total participation. Limited research examined the perceived barriers to participation, however findings did indicate the multiple influence of factors on participation. Only one study was found which had explored PA explicitly in a sample of individuals receiving OST and this was a quantitative US-based study.

Theoretical approaches provide useful frameworks for understanding complex behaviours such as PA. Historically, theory aimed at understanding and explaining PA has focused on individual factors, however increasing research has highlighted the role of wider environmental influences. A social-ecological approach was used in this study to guide and present the findings, considering the influences on PA among individuals receiving OST and the individual, social, physical-environment and policy levels. In order to collect data a mixed methods approach was utilized. Given the limited amount research in the area this approach was deemed the most appropriate in order to gain an in-depth understanding of the topic. Self-report quantitative surveys were administered to 100 participants, in order to collect information on demographics, PA participation, perceived benefits and barriers to PA and health-related quality of life. A smaller sub-sample of participants also provided objective data on their PA levels, measured through the use of pedometers. Following this quantitative phase, qualitative data was gathered from 30 individuals to further expand upon the first phase of data collection. Topics covered included previous PA; current PA participation and attitudes towards participation; perceived benefits and barriers to PA participation; perceived benefits of PA participation; and future goals and aspirations for PA participation.

7.2 Study findings

The first phase of data collection found high levels of PA for much of the sample, primarily through walking, with lower levels of participation in sport and exercise. Despite high levels of total PA, low levels of health-related quality of life were found. Benefits to participation in PA were widely reported, with health-related factors perceived as the biggest barriers to participation. A small feasibility study within this larger exploration also found evidence for the successful use of pedometers in this population to measure PA objectively, with results also indicating high levels of walking in this sample.

Going beyond the quantitative data gathered it was found that walking was undertaken primarily as a form of active transport. Again, participation in

structured forms of PA was low, despite a keen interest by most participants to engage in sport and exercise. Additionally the sample described engaging in high amounts of sedentary behaviours. Barriers to participation were explored in relation to both structured and unstructured PA, with more barriers identified to participating in sport and exercise. Barriers were identified at the individual, social, physical-environmental and policy levels.

In this study aiming to understand PA participation among individuals receiving OST, both phases of research indicated that individuals within this population are often physically active, primarily through active transport in the form of walking. However, participation in structured forms of sport and exercise was low and indeed for most participants often multiple barriers were present in their lives preventing them from participation in these PA forms.

In line with other research findings on drug users, this population expressed an interest in PA and in particular, increasing participation in sport and exercise. Of the types of activity most desired by participants, swimming and the use of a gym were most frequently highlighted. These were activities participants had often previously participated in and were often deemed the most suitable given physical health limitations. Reflected in the quantitative data, these activity types were also the most widely participated in by those were active, highlighting a similarity between this sample and the general population. Additionally, participants expressed a willingness to try a wide variety of activities in which they had not previously participated.

A particularly important theme that ran throughout participants' discussions of previous, current and future sport and exercise participation, was the role of social support. For those who had previously participated in sport and exercise, or those who were currently social support in terms of encouragement in being active as well as someone to be active with were unanimously cited. During their receipt of OST, for many, social isolation emerged as a problem. For many their social circles consisted predominantly of individuals that they had met during their drug-using career and were also using themselves. An important part of moving away from their previous drug using lives, was the distancing of themselves from their

previous drug using circles. However, this often left individuals feeling isolated, as these social relationships were not replaced with new ones, due to an uncertainty of how to meet new people that were not involved in drug use. This lack of support was seen as a major barrier to both initiating and potentially maintaining participation. Gaining social contact through participation was a widely desired benefit and motivation for participating in future sport and exercise as individuals moved along their recovery journey.

The low levels of health and well-being in this population were widely reported as impacting upon PA participation. A large number of individuals reported physical and/or mental health problems, some of which were universal, and others relating specifically to their drug use and OST. For the most inactive of participants, very poor health affected PA across the board, limiting daily living activities such as walking. Those who engaged in relatively high levels of walking, often due to necessity rather than choice, regularly reported that health problems affected their ability to participate in certain types of sport and exercise. Swimming was cited as a particularly desirable activity by those who felt limited by physical health problems.

7.3 Implications

The findings of this study suggest that there is an interest and desire from individuals receiving OST to more frequently engage in structured forms of PA (sport and exercise). This is of relevance given the current UK policy on substance misuse, which emphasizes the need for individuals to engage in meaningful activities as part of their recovery. As such there is a clear need for strategies to increase PA, in particular sport and exercise, in individuals receiving OST.

Further research is required to determine the efficacy and feasibility of interventions to increase participation in sport and exercise in this population. Given the clear importance of social support, it is important to consider the opportunity for social interaction in the design of any activity. In particular, the opportunity for interacting with other individuals also in recovery and non-drug

using individuals would be of importance, given the frequent desire to move away from drug using social circles as part of recovery. As well as the opportunity to meet people through PA, encouragement to be active was also raised. While participants' social circles may be small/consist of others not interested in PA, as this group are receiving OST they are in regular contact with a number of health professionals, such as support workers and pharmacists. This contact could provide an opportunity for both emotional and informational support.

It is also important that often complex physical and psychological health needs of this population be taken into account in the design of any PA programme. The types of PA that individuals are able to perform may be limited by their physical health and so the Additionally it would be important to assess participants' health before undertaking any new PA. This would ensure that individuals were safe to begin any activity and may also increase their confidence in being able to perform the PA on offer. As such, it would be important that those professionals leading any PA sessions be familiar with and understanding of this population and any specific issues that may become relevant relating to their recovery journey e.g. side effects of reducing OST.

7.3 Limitations

As highlighted earlier in this thesis, this study is not without limitations. The quantitative phase of this study was primarily a feasibility study and consisted of no formal power calculation, limiting the generalizability of the findings. The methods of recruitment and issues of self-selection into the study by participants may also have impacted on the representativeness of findings.

7.4 Conclusion

This study has contributed to the literature on PA among individuals receiving OST, as the first study to explicitly explore PA among this population in the UK. Physical activity participation levels and the perceived benefits and barriers to PA participation were explored both quantitatively and qualitatively. It is evident that there is a need for strategies to increase participation in structured forms of PA in

this group, which may yield benefits in line with recovery aims. However, this population faces a number of barriers to participation at various levels of influence that need to be considered and addressed in the design of PA programmes.

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Appendix A. Summary table of physical activity and drug use studies

Study	Location	Setting	n	Population	Method	Aim(s)	Findings
Burling et al. (1992)	USA	Residential rehabilitation programme	34	Homeless veterans with substance misuse problems	Longitudinal softball intervention	To explore the efficacy of a softball programme as an adjunct to treatment	Increased rates of abstinence among softball group and improved completion of programme
Williams (2000)	Denmark	Community	20	Offending drug users attending a day treatment centre	Pilot study – longitudinal strength training intervention	To explore the efficacy of a strength training programme as an adjunct to treatment	Strength training viewed as an important tool in preventing relapse
Roessler (2010)	Denmark	Community	38	Drug users attending a day clinic	Pilot study – longitudinal exercise intervention	To explore the role of exercise in altering the behaviour and body image of drug users	Improved fitness, quality of life and reduced drug use during training programme; just over 50% completed programme

Brown et al. (2010)	USA	Community	16	Drug users engaged in outpatient treatment	Pilot study – longitudinal exercise intervention	To examine the feasibility of aerobic exercise as an adjunct to other substance misuse treatment	Significant increase in abstinence and treatment outcomes, and cardiorespiratory fitness
Weinstock, Barry and Petry (2008)	USA	Community	187	New admissions to intensive outpatient treatment for substance use disorders	Two randomized clinical trials	Investigate the association between completion of exercise-related activities and substance user disorders treatment outcome	Those engaged in exercise-related activities achieved longer durations of abstinence
Peterson and Johnstone (1995)	USA	Residential treatment in prison	43	Female offenders with a history of polysubstance misuse	Longitudinal exercise intervention	Explore the efficacy of a wellness programme (which included PA) in treatment	Significant improvements in physical fitness; enhancements in psychological well-being, and relapse prevention skills
Li, Chen and Mo (2002)	China	In-patient treatment centre	86	Heroin users	Random assignment to Qigong treatment	Explore the effectiveness of Qigong therapy on detoxification of heroin addicts versus medical and non-medical	Reduction of withdrawal symptoms more rapidly; lower reported symptoms

						treatment	
Shaffer, LaSalvia and Stein (1997)	USA	Community	61	Outpatient methadone recipients	A randomized clinical trial – longitudinal	To compare treatment outcomes of group Hatha yoga versus group psychodynamic therapy	No difference between treatment types – both reduced drug use and criminal activity
Benyon et al. (2013)	UK	Community	17 drug users; 7 gym instructors	Drug users over 40 years old	Observational pilot study	To test the efficacy and feasibility of an exercise referral programme to improve the health of older drug users	Health and social barriers to regular participation; some improvements in health measures; found enjoyable
Neale, Bloor and McKeganey (2007)	UK	Community	606	Heroin users	Structured questionnaires	Larger study investigating how heroin users spend their spare time	Sport the most common type of interest reported; males significantly more interested in sport than females
Drumm et al. (2005)	USA	Community	28	Chronic and injecting street drug users	Qualitative interviews	To explore drug users' self-care strategies	Pro-active in self-care, including strategies to increase PA

Duterte et al., (2001)	USA	Community	238	Current drug users	Qualitative interviews and quantitative surveys	To explore drug users' health care experiences	Drug users engage in PA similarly to the general population
Holt and Treloar (2012)	Australia	Community	77	Drug users currently/recently engaged in treatment	Qualitative interviews	To explore the self-care strategies of drug users	Participants undertook self-care strategies including PA
Powers, Woody and Sachs (1999)	USA	Community	45	Injecting drug users	Qualitative interviews	To explore the role of sport in participants' lives	Sport is important; provides a distinction and mental release
Neale, Nettleton and Pickering (2012)	UK	Community drug services, pharmacies and residential treatment settings	40	Current or ex-heroin users	Qualitative interviews (37 longitudinal)	To explore PA participation, desire to participate and barriers to participation	Clear interest in PA; little structured PA during heavy drug use, but still active through walking and cycling; diverse health and social benefits; personal, social and structural barriers
Fischer et al. (2012)	UK	Prison	25	Class A drug users new to prison	Cross sectional PA survey; submaximal fitness test; pedometer for one week	To explore drug users' PA levels prior to and upon entry to prison	High levels of PA and fitness before entry to prison; walking reduced in prison

Smit et al. (2006)	USA	Community	324	Injecting drug users	Cross sectional PA survey	To compare PA levels between HIV-positive and HIV-negative injecting drug users; and between those receiving treatment and no treatment for HIV.	High levels of everyday activity, primarily through walking; structured PA was low
Williams and Strean (2004)	N/A	N/A	N/A	N/A	Review of the literature on PA as an adjunct to substance abuse treatment	Variables contributing to addiction and a summary of the relationship between PA and improvements to many of these variables	More research is needed; the numerous benefits of PA can be an important adjunct to substance abuse treatment.
Caviness et al. (2013)	USA	Community	305	Methadone maintained individuals on a smoking cessation intervention trial	Cross sectional PA and perceived barriers and benefits to PA surveys	To examine exercise attitudes and PA participation	Participants perceived many benefits to PA and few barriers, however only 38% met weekly PA recommendations and 25% reported no PA

OXFORD BROOKES UNIVERSITY

RESEARCH PARTICIPANT INFORMATION SHEET

THE ROLE OF PHYSICAL ACTIVITY IN THE LIVES OF DRUG USERS RECEIVING PRESCRIBING INTERVENTIONS

You are being invited to take part in a PhD research study. Before you decide whether or not to take part, it is important that you understand why the research is being done and what it will involve. Please take time to read the following information carefully and feel free to ask any questions.

What is the purpose of the study?

Prescribing interventions are a major treatment for illicit opioid dependence. There has been a lot of research on people receiving prescribing interventions, but we still need to know more about their everyday lives, and particularly what, if any, physical activity they do. Within the general population, many benefits of physical activity have been highlighted. In order to enable drug users receiving prescribing treatments to benefit from the potential gains in health and well-being associated with physical activity, more research is required into their current activity levels and experiences and factors that may assist them to adopt more physically active lifestyles.

Why have I been invited to participate?

You have been invited to participate in this study because you are currently receiving a form of substitute medication for an illicit drug. We will aim to recruit individuals like you, from two cities in Southern England.

Do I have to take part?

Nobody has to take part in the study. Taking part is entirely voluntary and you would be free to withdraw at any point. Refusing to take part would not affect your treatment or the help you receive from any service in any way.

What would happen if I agreed to take part?

If you decided to take part you would be given this information sheet to keep and asked to sign a consent form. We would then arrange to meet again at a time and location convenient to you, for what should take no longer than 60 minutes. First we would ask you to provide us with a little bit of background information about yourself, your circumstances and your drug use. This would be followed by three questionnaires: one asking about your physical activity

habits; one on what may enable you and prevent you from being active and a final questionnaire on your general health. You would not have to answer any questions that you did not feel happy about. You may also be asked to wear a pedometer for up to seven days to record the number of steps you take per day. Again, you would not have to do this if you did not feel comfortable about it. If you agree to wear the pedometer we will also arrange to collect it from you at a time and location convenient to you. This final meeting should take no longer than 5 minutes.

What are the possible benefits of taking part?

The findings of the research will be used to better understand how active drug users receiving prescribing interventions are and what factors might enable them to be more active. Light refreshments will be provided to compensate you for your time assisting us with the study and you will be offered individual feedback on your physical activity levels.

Will what I say be kept confidential?

All information collected about you during the course of the study would be kept strictly confidential, subject to legal limitations. You would not have to answer any questions you feel unhappy about and your name would not be included on any documents and so it would not be possible to identify you from any of our reports or publications. All data from the study will be stored securely in a locked filing cabinet or on a password protected computer for a period of eight years after the study is finished. This is standard research practice.

What will happen to the results of the study?

The findings will be reported in the researcher's PhD thesis and distributed in research papers, reports, presentations and leaflets. We would also be very happy to send you information on our results or you could pick up one of our findings leaflets from your pharmacy.

Who is organising the research?

A PhD student at Oxford Brookes University is conducting the study.

What are the insurance/indemnity arrangements?

Insurance for the study will be provided by Oxford Brookes University

Who has reviewed the study?

The School of Life Sciences at Oxford Brookes University and the NHS research ethics committee have approved the study.

What if I wish to complain about the way in which this study has been conducted?

If you have *any* cause to complain about *any* aspect of the way in which you have been approached or treated during the course of this study please raise your concerns in the first instance with the researcher's supervisors: **Professor Jo Neale:** 01865 482696 or jneale@brookes.ac.uk **Professor Helen Dawes:** 01865 483293 hdawes@brookes.ac.uk. In the unlikely event that this does not receive a satisfactory response please contact the sponsor of the research project, **Professor Linda King:** 01865 483241 or laking@brookes.ac.uk.

If you require further details about the research or want to take part, please contact:

Carly Wheeler, School of Health and Social Care, Oxford Brookes University, Jack Straw's Lane, Oxford, OX3 0FL. Tel: XXXXX XXXXXX; Email: carly.wheeler@brookes.ac.uk

Thank you for reading.

CONSENT FORM

OXFORD BROOKES UNIVERSITY

Full title of project: The role of physical activity in the lives of drug users receiving prescribing interventions

Name of researcher: Carly Wheeler

Contact details: School of Health & Social Care, Oxford Brookes University, Jack Straw's Lane, Marston, Oxford, OX3 0FL. Tel: XXXXX XXXXXX

	Please initial each box
1. I confirm that I have read and understand the information sheet dated 12.10.10 (version 2) for the above study and have had the opportunity to ask questions.	☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason.	☐
3. I understand that anonymised data, including anonymised personal data, collected during the study may be looked at by representatives of the sponsor of the research or by others as part of routine research monitoring processes. I give permission for this.	☐
4. I agree to take part in the above study.	☐

Name of Participant	Date	Signature

Name of Researcher	Date	Signature

DEMOGRAPHIC QUESTIONNAIRE

1. Date of interview: ☐☐/☐☐/☐☐

2. Location of interview: .....

3. Recruitment location: .....

(Personal Data)

4. Age: ☐☐

5. Sex: Male: ☐ 1 Female: ☐ 2

6. Ethnic background:

Asian or British Asian

☐ 1 Indian ☐ 2 Pakistani ☐ 3 Bangladeshi

☐ 4 Any other Asian background

Black or Black British

☐ 5 Caribbean ☐ 6 African

☐ 7 Any other Black background

Chinese or other Ethnic Group

☐ 8 Chinese ☐ 9 Any other ethnic group

Mixed

☐ 10 White and Caribbean

☐ 11 White and Black African

☐ 12 White and Asian

☐ 13 Any other mixed background

White

☐ 14 British ☐ 15 Irish

☐ 16 Any other White background

7. Reason for refusing to be interviewed:

.....

8. Reason for premature termination of interview:

.....

Section A (Drug Treatment)

CURRENT PRESCRIPTION DRUGS

A1. Can I just double-check what drugs, if any, you are currently being prescribed?

Please tell me about ALL prescription drugs – not just those you are receiving for your drug problem.

Drug Name	i) Daily Amount	ii) Reason
a)		
b)		
c)		
d)		
e)		
f)		
g)		
h)		
i)		
j)		
k)		

A2. Have you ever had a residential detox (i.e. an in-patient detox lasting 10 weeks or less)?

No ☐ 1 Yes ☐ 2

A3. If yes, was your most recent detox in the last four weeks?

No ☐ 1 Yes ☐ 2

A4. Have you ever been in a residential rehab (i.e. an in-patient rehab lasting more than 10 weeks)?

No ☐ 1 Yes ☐ 2

A5. If yes, was your most recent rehab in the last four weeks?

No ☐ 1 Yes ☐ 2

A6. How long was that rehab?

Days ☐☐ Weeks ☐☐ Months ☐☐

A7. Have you ever had one-to-one counseling for your drug use?

No ☐ 1 Yes ☐ 2

A8. If yes, was your most recent counseling session in the last four weeks?

No ☐ 1 Yes ☐ 2

A9. Have you ever attended any peer support groups, such as NA or AA?

No ☐ 1 Yes ☐ 2

A10. If yes, have you attended any support groups in the last four weeks?

No ☐ 1 Yes ☐ 2

A11. Are you receiving any other forms of treatment or support for your drug dependence? If yes, please specify:

……

Section B (Life Situation)

I'm now going to ask you some general questions about different aspects of your life. I will start with places you may have lived.

ACCOMMODATION

B1. Can you please tell me where you are <u>currently</u> living? *[Tick all that apply]*

Own house/flat	☐	Bedsit/hotel/boarding house	☐
Hostel or shelter	☐	Squat	☐
Sleeping rough	☐	House or home of friends	☐
Hospital	☐	House or home of relatives	☐
Other	☐	[If other, specify] ……	

B2. Who do you currently live with?

……

……

EDUCATION

B3. At what age did you leave school?

☐☐

B4. What is the highest qualification you attained?

……

EMPLOYMENT

B5. Do you currently have a job? *[I mean paid legal employment, not 'casual' or 'cash-in-hand' work]*

No ☐[1] Yes ☐[2]

B6. What is your current job?

……

B7. In this job are you working full time or part-time?

Full-time ☐ 1 Part-time ☐ 2

B7. Are you currently receiving any benefits? *[Tick all that apply]*

Attendance allowance ☐	Carer's allowance ☐
Child benefit ☐	Child tax credit ☐
Council tax benefit ☐	Disability living allowance ☐
Housing benefit ☐	Income support ☐
Job seeker's allowance ☐	Other ☐

[If other, specify] ……

B8. Do you currently have any of the following financial problems? *[Tick all that apply]*

Debts (legal) ☐	Debts (illegal) ☐
Benefit problem/s ☐	Other ☐

[If other, specify] ……

DAILY ROUTINE

B9. How would you describe your usual sleep pattern?

Very good	Quite good	Neither good nor poor	Quite poor	Very poor
☐	☐	☐	☐	☐

B10. Can you tell me how many meals you ate yesterday? *[Please do not count snacks].*

☐☐

B11. **Can you tell me how many snacks you ate yesterday?**

☐☐

Section C (Substance Use)

I am now going to ask you some questions about your use of drugs and alcohol.

Please remember that this is a confidential and independent interview and your answers will not be communicated to any treatment agency or to anyone else outside the study.

C1. What non-prescribed drugs have you used in the past 3 days (excluding alcohol and cigarettes)? *[Interviewer: prompt for cannabis if not mentioned]*

NB: for routes: 1 = oral 2 = snort/sniff 3 = smoke/chase 4 = inject

a) DAY 1 (yesterday)			b) DAY 2 (day before)			c) DAY 3 (day before)		
Substances	Amount	Route	Substances	Amount	Route	Substances	Amount	Route
i)			i)			i)		
ii)			ii).			ii)		
iii)			iii)			iii)		
iv)			iv)			iv)		
v)			v)			v)		

C2. What non-prescribed drugs have you used in the past 3 months?

Drug type	**i) Days used past 90 days** *[show card Appendix 1]*	**ii) Typical amount used on day when used in past 90 days**	**iii) Usual route**
a) Heroin			
b) Methadone			
c) Crack cocaine			
d) Crack powder			
e) Ecstasy			
f) Amphetamines			
g) Cannabis			
h) Buprenorphine/Subutex			
i) Benzodiazepines **e.g. Diazepam**			
j) OTC medicine (Nytol, Sudafed, Day/night Nurse)			
k) Solvents/ inhalants			
l) Tobacco/ Nicotine		Number of cigarettes _____	

C3. In the past 3 months, have you used any other non-prescribed drugs?

[Note: do not include prescribed drugs, e.g. anti-depressants]

No ☐ 1 Yes ☐ 2

C4. If yes, what did you use? *[Record and prompt: "anything else?"]*

…… .....

C5. How many days did you use *[drug type]?*

i) Other drugs *[record verbatim]*	**ii) Days used in past 3 months**
a).	
b).	
c).....	

C6. Now thinking about the past three months, what was your main drug? (excluding alcohol and tobacco/ nicotine)?

By 'main drug', I mean 'the drug which you used most of the time or which gave you most problems'.

.....

C7. Thinking about the past three months:

	Never or almost never	Sometimes	Often	Always or nearly always
a) Did you ever think that your *[main drug from C6]* use was out of control?	☐ 1	☐ 2	☐ 3	☐ 4
b) Did the prospect of not taking any *[main drug from C6]* make you anxious or worried?	☐ 1	☐ 2	☐ 3	☐ 4
c) Did you worry about your *[main drug from C6]* use?	☐ 1	☐ 2	☐ 3	☐ 4
d) Did you wish you could stop using *[main drug from C6]?*	☐ 1	☐ 2	☐ 3	☐ 4
	Easy	**Quite difficult**	**Very difficult**	**Impossible**
e) How difficult would you find it to stop, or go without [main drug from C6?]	☐ 1	☐ 2	☐ 3	☐ 4

ALCOHOL

Now I would like to ask you about alcohol.

C8. Have you had anything alcoholic to drink in the past 3 days?

No ☐ 1 Yes ☐ 2

C9. Thinking about the past 3 months:

	Never or almost never	Sometimes	Often	Always or nearly always
a) Did you ever think that your alcohol use was out of control?	☐ 1	☐ 2	☐ 3	☐ 4
b) Did the prospect of not taking any alcohol make you anxious or worried?	☐ 1	☐ 2	☐ 3	☐ 4
c) Did you worry about your alcohol use?	☐ 1	☐ 2	☐ 3	☐ 4
d) Did you wish you could stop using alcohol?	☐ 1	☐ 2	☐ 3	☐ 4
	Easy	**Quite difficult**	**Very difficult**	**Impossible**
e) How difficult would you find it to stop, or go without alcohol?	☐ 1	☐ 2	☐ 3	☐ 4

Section D (Risk Behaviours)

D1. Can I just check, have you ever injected?

No ☐ 1 Yes ☐ 2

D2. Have you injected a drug in the past 3 days?

No ☐ 1 Yes ☐ 2

Section E (Relationships)

PARTNER

E1. Which category best describes you at the moment?

Married ☐ 1
Partnered ☐ 2
Divorced ☐ 3
Widowed ☐ 4
Single ☐ 5

CHILDREN

E2. Do you have any children?

No ☐ 1 Yes ☐ 2

E3. If yes, can you tell me a bit about your children?

	i) Age of child	ii) Is the child living with you?
a) Child 1	☐☐ Years ☐☐ Mths	No ☐ 1 Yes ☐ 2
b) Child 2	☐☐ Years ☐☐ Mths	No ☐ 1 Yes ☐ 2
c) Child 3	☐☐ Years ☐☐ Mths	No ☐ 1 Yes ☐ 2
d) Child 4	☐☐ Years ☐☐ Mths	No ☐ 1 Yes ☐ 2
e) Child 5	☐☐ Years ☐☐ Mths	No ☐ 1 Yes ☐ 2
f) Child 6	☐☐ Years ☐☐ Mths	No ☐ 1 Yes ☐ 2

FRIENDS

I'd now like to ask you about your friends.

E4. How many close friends do you feel that you have? By 'close friends', I mean people you could rely on in a difficult situation.

☐☐

Section F (**Legal**)

F1. Have you ever been to prison?

No ☐ 1 Yes ☐ 1

F2. If yes, how long have you spent in prison (including remands and sentences)?

☐☐

F3. When were you last in prison?

☐☐ Month ☐☐☐☐ Year

F4. What was the duration of your last stay in prison?

☐☐ Days ☐☐ Weeks ☐☐ Months ☐☐ Years

Any questions/concerns from interviewee?

……

……

……

Additional comments

……

……

……

Modified Paffenbarger Physical Activity Questionnaire

PLEASE ANSWER THE FOLLOWING QUESTIONS BASED ON YOUR AVERAGE DAILY PHYSICAL ACTIVITY FOR A TYPICAL DAY DURING THE LAST WEEK

1. How many stairs did you climb up on an average day during the past week?

   ..... stairs per day (1 flight or floor = 10 stairs)

2. How many miles did you walk on an average day during the past week?

   ..... mile(s) per day

3. List any sports, leisure, or recreational activities you have participated in on a regular basis during the past week. Enter the average number of times per week you took part in these activities and the average duration of the se sessions. Include only time you were physically active (that is, actual playing or activity time).

Sport or recreation	Times per week	Time per episode	
		Hours	Minutes

Exercise Benefits/Barriers Scale

DIRECTIONS: Below are statements that relate to ideas about exercise. Please indicate the degree to which you agree or disagree with the statements by circling SA for strongly agree, A for agree, D for disagree or SD for strongly disagree.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. I enjoy exercise	SA	A	D	DS
2. Exercise decreases feelings of stress and tension for me	SA	A	D	DS
3. Exercise improves my mental health	SA	A	D	DS
4. Exercising takes too much of my time	SA	A	D	DS
5. I will prevent heart attacks by exercising	SA	A	D	DS
6. Exercise tires me	SA	A	D	DS
7. Exercise increases my muscle strength	SA	A	D	DS
8. Exercise gives me a sense of personal accomplishment	SA	A	D	DS
9. Places for me to exercise are too far away	SA	A	D	DS
10. Exercising makes me feel relaxed	SA	A	D	DS
11. Exercising lets me have contact with friends and persons I enjoy	SA	A	D	DS
12. I am too embarrassed to exercise	SA	A	D	DS
13. Exercising will keep me from having high blood pressure	SA	A	D	DS
14. It costs too much money to exercise	SA	A	D	DS
15. Exercising increases my level of physical fitness	SA	A	D	DS
16. Exercise facilities do not have convenient schedules for me	SA	A	D	DS
17. My muscle tone is improved with exercise	SA	A	D	DS
18. Exercising improves functioning of my cardiovascular system	SA	A	D	DS

19. I am fatigued by exercise	SA	A	D	DS
20. I have improved feelings of well being from exercise	SA	A	D	DS
21. My spouse (or significant other) does not encourage exercising	SA	A	D	DS
22. Exercise increases my stamina	SA	A	D	DS
23. Exercise improves my flexibility	SA	A	D	DS
24. Exercise takes too much time from family relationships	SA	A	D	DS
25. My disposition is improved by exercise	SA	A	D	DS
26. Exercising helps me sleep better at night	SA	A	D	DS
27. I will live longer if I exercise	SA	A	D	DS
28. I think people in exercise clothes look funny	SA	A	D	DS
29. Exercise helps me decrease fatigue	SA	A	D	DS
30. Exercising is a good way for me to meet new people	SA	A	D	DS
31. My physical endurance is improved by exercising	SA	A	D	DS
32. Exercising improves my self-concept	SA	A	D	DS
33. My family members do not encourage me to exercise	SA	A	D	DS
34. Exercising increases my mental alertness	SA	A	D	DS
35. Exercise allows me to carry out normal activities without becoming tired	SA	A	D	DS
36. Exercise improves the quality of my work	SA	A	D	DS
37. Exercise takes too much time away from my family	SA	A	D	DS
38. Exercise is good entertainment for me	SA	A	D	DS

39. Exercising increases my acceptance by others	SA	A	D	DS
40. Exercise is hard work for me	SA	A	D	DS
41. Exercise improves overall body functioning for me	SA	A	D	DS
42. There are too few places for me to exercise	SA	A	D	DS
43. Exercise improves the way my body looks	SA	A	D	DS

SF-36 HEALTH SURVEY

INSTRUCTIONS: This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities.

Answer every question by marking the answer as indicated. If you are unsure about how to answer a question, please give the best answer you can.

1. In general, would you say your health is:

(circle one)

Excellent 1

Very good 2

Good 3

Fair 4

Poor 5

2. Compared to one year ago, how would you rate your health in general now?

(circle one)

Much better now than one year ago 1

Somewhat better now than one year ago 2

About the same as one year ago 3

Somewhat worse now than one year ago 4

Much worse now than one year ago 5

3. The following questions are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

(circle one number on each line)

ACTIVITIES	Yes, Limited A Lot	Yes, Limited A Little	No, Not Limited At All
a. **Vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports	1	2	3
b. **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	1	2	3
c. Lifting or carrying groceries	1	2	3
d. Climbing **several** flights of stairs	1	2	3
e. Climbing **one** flight of stairs	1	2	3
f. Bending, kneeling, or stooping	1	2	3
g. Walking **more than a mile**	1	2	3
h. Walking **half a mile**	1	2	3
i. Walking **one hundred yards**	1	2	3
j. Bathing or dressing yourself	1	2	3

4. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

(circle one number on each line)

	YES	NO
a. Cut down on the **amount of time** you spent on work or other activities	1	2
b. **Accomplished less** than you would like	1	2
c. Were limited in the **kind** of work or other activities	1	2
d. Had **difficulty** performing the work or other activities (for example, it took extra effort)	1	2

5. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

(circle one number on each line)

	YES	NO
a. Cut down on the **amount of time** you spent on work or other activities	1	2
b. **Accomplished less** than you would like	1	2
c. Didn't do work or other activities as **carefully** as usual	1	2

6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours, or groups?

(circle one)

Not at all 1

Slightly 2

Moderately 3

Quite a bit 4

Extremely 5

7. How much bodily pain have you had during the past 4 weeks?

(circle one)

None 1

Very mild 2

Mild 3

Moderate 4

Severe 5

Very severe 6

(SF-36 Standard U.K. Version 1.0)

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

(circle one)

Not at all 1

A little bit 2

Moderately 3

Quite a bit 4

Extremely 5

9. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks -

(circle one number on each line)

	All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	None of the Time
a. Did you feel full of life?	1	2	3	4	5	6
b. Have you been a very nervous person?	1	2	3	4	5	6
c. Have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6
d. Have you felt calm and peaceful?	1	2	3	4	5	6
e. Did you have a lot of energy?	1	2	3	4	5	6
f. Have you felt downhearted and low?	1	2	3	4	5	6
g. Did you feel worn out?	1	2	3	4	5	6
h. Have you been a happy person?	1	2	3	4	5	6
i. Did you feel tired?	1	2	3	4	5	6

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

(circle one)

All of the time.....1

Most of the time.....2

Some of the time.....3

A little of the time.....4

None of the time.....5

11. How TRUE or FALSE is each of the following statements for you?

(circle one number on each line)

	Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
a. I seem to get ill more easily than other people	1	2	3	4	5
b. I am as healthy as anybody I know	1	2	3	4	5
c. I expect my health to get worse	1	2	3	4	5
d. My health is excellent	1	2	3	4	5

U.K.

SF-36

Pedometer Log Sheet

Participant ID: _____

The pedometer should be worn all day long, except when bathing, swimming or sleeping.

Please tick on which days the pedometer was worn throughout the whole day.

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7

OXFORD BROOKES UNIVERSITY

RESEARCH PARTICIPANT INFORMATION SHEET

THE ROLE OF PHYSICAL ACTIVITY IN THE LIVES OF DRUG USERS RECEIVING PRESCRIBING INTERVENTIONS FOR ILLICIT OPIOID DEPENDENCE.

You are being invited to take part in a research study. Before you decide whether or not to take part, it is important that you understand why the research is being done and what it will involve. Please take time to read the following information carefully and feel free to ask any questions.

What is the purpose of the study?

Prescribing interventions are a major treatment for illicit opioid dependence. There has been a lot of research on people receiving prescribing interventions, but little is known about their everyday lives, including what, if any, physical activity they do. Within the general population, many benefits of physical activity have been highlighted. In order to enable drug users receiving prescribing treatments to benefit from the potential gains in health and well-being associated with physical activity, more research is required into their current activity levels and experiences and factors that may assist them to adopt more physically active lifestyles.

This is the second part of a PhD research project being conducted by Carly Wheeler at Oxford Brookes University. This project aims to build upon the findings from the previous study and to explore physical activity in more detail using in-depth interviews.

Why have I been invited to participate?

You have been invited to participate in this study because you are currently receiving a form of substitute medication for an illicit drug. We will aim to recruit individuals like you, from across Southern England.

Do I have to take part?

Nobody has to take part in the study. Taking part is entirely voluntary and you would be free to withdraw at any point. Refusing to take part would not affect your treatment or the help you receive from any service in any way.

What would happen if I agreed to take part?

If you decided to take part, you would be asked to participate in one interview lasting approximately 60 to 90 minutes. You would be given this information sheet to keep and asked to sign a consent form. We would then arrange to meet again at a time and location convenient to you. The interview would be conducted by Carly Wheeler and, with your permission, audio-recorded. The interview topics have been informed by the findings from the first stage of the research project, and it is likely that the topics covered will include basic information about you and your general life circumstances; your drug use; previous and current physical activity; barriers and enablers to physical activity; attitudes and beliefs regarding physical activity and your perceived impact of physical activity on past, present and future well-being. You would not have to answer any questions that you did not feel happy about.

What are the possible benefits of taking part?

The findings of the research will be used to better understand the physical activity levels of drug users receiving prescribing interventions and what factors might enable them to be more active. Refreshments/vouchers will be provided to compensate you for your time assisting us with the study.

Are there any risks involved with taking part?

There are no expected risks or discomforts from taking part in this project.

Will I reimbursed for taking part?

If you decided to take part you would be offered a £15 supermarket voucher to compensate for your time and effort.

Will what I say be kept confidential?

All information collected about you during the course of the study would be kept strictly confidential, subject to legal limitations. You would not have to answer any questions you feel unhappy about and although direct quotes from you may be used in reports and publications, your name and other identifying information will be kept anonymous. All data from the study will be stored securely in a locked filing cabinet or on a password protected computer for a period of ten years after the study is finished. This is a requirement of Oxford Brookes University and is in line with the Code of Practice Policy on Academic Integrity.

You also have the right to withdraw from the study at anytime. In the event you choose to withdraw from the study all information you provide (including audio tapes) will be destroyed and omitted from any reports or publications.

What will happen to the results of the study?

The findings will be reported in the researcher's PhD thesis and distributed in research papers, reports, presentations and leaflets. We would also be very happy to send you information on our results or you could pick up one of our findings leaflets from the pharmacy you use.

Who has reviewed the study?

This study has been reviewed and approved by Oxford Brookes University and an NHS research ethics committee.

What if I wish to complain about the way in which this study has been conducted?

If you have *any* concerns about *any* aspect of the conduct of the study, please contact Hazel Abbott, the Chair of the School of Health and Social Care Research Ethics Committee at Oxford Brookes University on 01865 482639 or heabbott@brookes.ac.uk.

If you require further details about the research or want to take part, please contact:

Carly Wheeler, School of Health and Social Care, Oxford Brookes University, Jack Straw's Lane, Oxford, OX3 0FL. Tel: XXXXX XXXXXX; Email: carly.wheeler@brookes.ac.uk

Thank you for reading.

CONSENT FORM

OXFORD BROOKES UNIVERSITY

Full title of project: The role of physical activity in the lives of drug users receiving prescribing interventions

Name of researcher: Carly Wheeler

Contact details: School of Health & Social Care, Oxford Brookes University, Jack Straw's Lane, Marston, Oxford, OX3 0FL. Tel: XXXXX XXXXXX

	Please initial each box
1. I confirm that I have read and understand the information sheet dated 25.05.11 (version 2) for the above study and have had the opportunity to ask questions.	☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason.	☐
3. I understand that anonymised data, including anonymised personal data, collected during the study may be looked at by representatives of the sponsor of the research or by others as part of routine research monitoring processes. I give permission for this.	☐
4. I agree that any words I say during the interview may be used anonymously in the presentation of this research project.	☐
5. I agree that the interview may be audio-recorded.	☐
6. I agree to take part in the above study.	☐

Name of Participant	Date	Signature

Name of Researcher	Date	Signature

The Role of Physical Activity in the Lives of Drug Users Receiving Prescribing Interventions – Topic Guide

**** Text contact to let them know interview is starting (include location) ****

Introduction

- Introduce myself and the study
- Emphasise non-judgmental position; not involved with services; not a counselor
- Assure confidentiality
- Mobiles off
- Check permission for audio recorder
- Thank interviewee for agreeing to participate; no right/wrong answers, views and experiences are what matter

1. Background information

I'd like to start by asking you a few general background questions

- How old are you?
- What is your ethnic background?
- What type of accommodation are you currently living in? (house/hostel/sleeping rough/link to PA later i.e. stairs climbed, sleeping rough and walking)
- Who do you currently live with? (alone/family/friends/shared)
- Can you tell me about your family and friends? (partner/children/size of family/number of close friends)
- At what age did you leave school? Do you have any qualifications? If so, what?
- Do you have any source of income at the moment? If so, what? (employment/benefits/begging)
- Do you have any financial problems?

2. Drug related information (current and previous)

I'm now going to ask you about your drug and alcohol use

- What is your main/current drug/s? (amount used/frequency/route/injecting site)
- How did your drug use start? Has it changed over time? (if not currently injecting, have they previously?)
- Do you drink/smoke (tobacco/nicotine/cannabis)?
- What substitute medication are you currently being prescribed? (how much/length of time on medication/other substitutes used previously/side effects)
- Are you currently/have you previously received any other forms of treatment for your drug use? (drugs worker/residential/self-help experiences/informal support/duration of treatment)
- Have you ever been in prison? (total amount of time spent in prison/date of last stay in prison and duration)

3. Health

How is your health?

- Is there anything you are seeing a doctor for? (physical and mental/what prescriptions are being taken/amount/how often/side effects)
- Are you experiencing any physical health problems that you don't see a doctor for? (general/drug related/previous physical health issues)
- BBV? (Have you ever been tested?/When were you tested?/Do you know the results?)
- Are you experiencing any mental health problems that you're not seeing a doctor for? (anxiety/depression/mood swings/previous mental health issues)
- Diet – on a typical day what would you eat? (number of meals/snacks/did they prepare it/why that food i.e. cost, convenience, health)

4. Reflections on past physical activity

I'd like you to think back previously, about your past now…

- Have you ever participated in any physical activity (including exercise and sport)? (What/how much/how often/circumstances surrounding participation/enjoyment)
- How did you get into physical activity?
- Has your participation in physical activity changed throughout your past up until now? (How? Including in relation to substance use)
- How does physical activity that you do now compare with what you used to do in the past? (changes over life/why?/drug/treatment related)

5. Current physical activity

- Do you do any physical activity at the moment? (What activity(s)/how long for/how long have been doing it/how often/intensity/with whom?/probe transport)
- Is physical activity part of your routine? (scheduled into week?)
- How about your other time how do you spend it? (hobbies/sedentary time?)
- General attitudes towards physical activity
- Types of physical activity enjoyed/attitudes towards different types of physical activity
- Family and physical activity
- Friends and physical activity

6. Barriers

- What prevents you from participating in physical activity?
  - Time (how do you spend time generally/routine/appointments/pharmacy/why/how is lack of time a barrier/what do you like to do with your time?)
  - Cost (entrance fees/joining fees/cost compared to other things/awareness of discounts)

- Health (poor health/unable to do certain types of activity/getting hurt/injured/sweating/side effects of medication, substitute and otherwise)
- Lack of motivation (lack of incentive/lack of knowledge of how to go about participating/no one to exercise with/embarrassment)
- Environment (distance to places/unsafe/hills/lack of activities in area)
- Past experiences (have any past experiences put them off?)
- Fear (related to beliefs/environmental/practical/body image)
- Any other drug related issues (perceptions of exercising while on drugs/substitute medication/in recovery)

7. **Overcoming barriers**
    - How could these barriers be overcome?
    - How do people who are more active overcome barriers?
    - What do/would you like about participating in physical activity?
    - What motivates you? Or Would motivate you (individual, social, environment)

8. **Future physical activity**
    - You've told me what you do now. Is this enough? Are you happy with it would you like to do more?
    - Plans/goals for future physical activity participation
    - "Ideal" physical activity participation
    - Perceived mechanisms that would make it possible to participate in more/different types of physical activity.

9. **Promotional strategies/ideas**
    - Do you know of any information or promotional material on physical activity?
    - Have any treatment services ever talked to you about physical activity? If yes, what did they say?)
    - Would you want to be told how much physical activity you should be doing? (to what extent – prescription/encouragement/basic ideas)
    - Are any schemes in place to allow you to do more physical activity/to promote it?

10. **Beliefs/knowledge about physical activity benefits**
    - Is physical activity important? If so, why?
    - In what way is physical activity important?
        - Fitness
        - Physical health
        - Mental health
        - Weight control/body image
        - General well-being
        - Other reasons?
    - Do you know how much physical activity you should be doing?

- What types of physical activity do you enjoy? Why?
- How does physical activity rate in comparison to other activities they might do in their lives (priority given to physical activity?)

11. Any other comments

- Other activities participated in/leisure time
- Is there anything else you would like to add about your physical activity experiences?

**** Thank participant for taking part and debrief ****