

THE EFFICACY OF EXERCISE REFERRAL AS AN INTERVENTION FOR IRISH MALE PRISONERS PRESENTING WITH MENTAL HEALTH SYMPTOMS.

Abstract

Purpose – The use of exercise as an intervention to improve health in the general population is well documented. The purpose of this paper is to explore whether an exercise referral scheme can be an effective health promotion tool for male prisoners in Ireland, presenting with mental health symptoms.

Design/methodology/approach – This mixed methods study with a pre- and post-intervention design was conducted in Mountjoy Prison, Dublin, which has a total nominal capacity for approximately 790 prisoners. Reliable and validated symptom assessment scales were used to assess levels of depression, anxiety, stress, self-esteem and anger amongst a sample of 40 prisoners pre- and post-intervention. The scales used were 1) the Depression, Anxiety and Stress scale or DASS-42 (Lovibond and Lovibond, 1995), 2) the Novaco Anger Scale (Novaco 1994), 3) the Rosenberg Self-Esteem Scale (Rosenberg 1964) and 4) the Zung Self-Rated Anxiety Scale (Zung 1971). Semi-structured interviews were also conducted with a sub-set of the participants post-intervention which satisfied the mixed methods aspect of the study. The data gathered from the self-rating scales were imported into SPSS 22 for statistical testing for significance. Wilcoxon's signed rank test was then used to measure significance of changes. Thematic content analysis was performed on the qualitative data.

Findings - Post-intervention, significant levels of improvement were achieved in the levels of depression, anxiety (DASS), anxiety (Zung), stress, anger, and self-esteem for 29 of the 30 prisoners who completed the study. The incidence of Normal Mood scores rose from 33% to 90% after the intervention, the incidence of Extremely Severe scores for Anxiety changed from 40% to 7%, Severe Stress scores changed from 27% to 3%, Normal Stress levels rose from 17% to 73%, Marked Anger ratings reduced from 40% to 3% and Low Self-Esteem levels reduced from 20% of participants pre-intervention to 7% post-intervention. Participants in the main perceived the experiences and outcomes of the intervention positively.

Research limitations/implications - The sample size and the study being carried in a single prison setting are the main limitations of this study.

Practical implications – The organisation and smooth running of the intervention and the positive results therein underpinned the practicality of this project

Social implications - The very positive results which this study yielded contribute new knowledge to the profile of Irish male prisoners' mental health. The authors contend that this study could be the foundation for a larger study or set of studies which should include a control group and one or more female prisoner cohorts. There is also an argument for a separate study to assess how positive changes in prisoners' mental health impacts on prison staff. This is based on the principle that, if prisoners have improved mental health, then they may behave differently and, in turn, there may be benefits for the staff that look after them.

Originality/value – This study was the first of its kind to explore the effectiveness of exercise referral as a health promotion intervention for Irish male prisoners with presenting with mental health symptoms.

Keywords Exercise Referral, Physical Exercise, Physical activity, Mental Illness, Mental Health, Mental Health in Prison

Paper type Research paper

Introduction

The International Centre for Prison Studies (2015) states that there are a total of 10.35 million people incarcerated worldwide and believes that this figure is rising on all five continents. Prisoners are internationally recognised as a sub-group of the general population who suffer from high levels of mental illness with Fazel and Baillargeon (2011) suggesting that mental health problems and disorders are more prevalent in prisons than in the general population.

Previous research indicates that the rates of mental illness in persons committed to prison are significantly higher than those in the general population (Singleton et al 1998; Linehan et al 2005). Snow et al (2002) found that, as a group, inmates are at higher risk of suicide than their community counterparts whilst Casey (2007) reported that prisoners are at a disproportionately higher risk of suicidal ideation than people in the general community. Hayes (2010) studied suicide rates in prisons in the USA and found that inmates are three times more likely to commit suicide than someone in the general population. Prins (2014) states the prevalence of certain mental illnesses in US prisons is far greater than in samples from the community. One reason which may predispose certain prisoners to mental illness is the fact that they generally come from very poor social conditions which, according to MacNamara and Mannix-MacNamara (2014), is often the catalyst for them becoming involved in criminal behaviour in the first place. However, there are also many incarcerated people who, for one reason or another, become mentally ill during their term of imprisonment. There is much evidence that reasons for such changes in mental and emotional well-being can be attributed to a variety of environmental factors within the institution. Nurse et al (2003) discovered that some of the key issues relating to the prison environment which adversely affected prisoners' mental health were isolation, lack of mental stimulation, drug abuse, bullying and lack of family contact. Kennedy et al (2005) found that other environmental issues such as overcrowding, noise levels and reduced privacy along with anguish over the continuation of life on the outside, were also contributing factors towards prisoners experiencing mental health difficulties. The WHO (2005) supports this view contending that the threat of violence, insecurity about the future, and inadequate health services, especially mental health services, are additional environmental factors which impact on the mental health of prisoners. Furthermore, Verdot et al (2010) suggest that whilst mood disorders such as depression, stress and anxiety are common in our society, the incidence of such illnesses is notably worse in prisons and believe that the root causes are overcrowding, loss of identity, lack of privacy and environmental issues.

Physical exercise is defined by the WHO (2011, p.1) as “any bodily movement which results in the expenditure of energy including partaking in sports, exercise, playing, walking, doing household chores or gardening”. It is one of many ‘alternative’ therapies such as music therapy, acupuncture, family therapy, relaxation, and mindfulness attracting increased scrutiny as interventions in the management of mental illness.

According to Booth et al (2012), physical activity is a cornerstone in the primary prevention of at least 35 chronic conditions. Earlier research studies have explored how physical exercise can benefit mental health. The Global Advocacy Council for Physical Activity (2010) found that physical activity enhanced mental health whilst Carek et al (2011) concluded that not only was physical activity associated with decreased symptoms of depression and anxiety; it was also implicated in the development of some psychological disorders. They suggest that physical activity compares favourably with antidepressant medications as a first-line aid for mild to moderate depression and has also been shown to improve depressive symptoms when used in conjunction with medications. Rimer et al (2012) highlighted that the use of exercise in treating mental illness is something which should be given more consideration, as unlike pharmacotherapy, it is practically free from side effects and, unlike the mainstream psychological therapies, it does not have an associated stigma. Kelleher et al (2014) found that physical activity can protect against symptoms of depression and stress in older people with further support for this approach coming from the Royal College of Psychiatrists in Britain (2014) which declared that physical activity can be as effective for mild depression as antidepressants and some psychological therapies such as cognitive behavioural therapy.

The argument for the use of exercise as a method to improve mental health is also promoted by the United States Department of Health and Human Services (2015) which states that participation in aerobic and muscle strengthening exercises 3-5 times per week can lead to a reduced risk of depression. Anxiety disorders are described by Campbell Burton et al (2013) as the most common mental health problem globally and according to Wegner et al (2014), their symptoms can be reduced by physical activity. Similarly, stress is recognised as an everyday occurrence and in itself is not a disease, however, Pedersen and Saltin (2015) state that, long-term, it can induce depression. Whilst a study by Wang et al (2014) was inconclusive as to whether aerobic exercise or strength-based training was most beneficial for relieving stress, they did find evidence to suggest that regular physical activity and fitness can reduce it. A recent study conducted by Becofsky et al (2015) concurs with all of the above research as its findings suggest that reduced or inadequate fitness levels are more strongly linked to the onset of elevated depressive symptoms than obesity.

Whilst there is a very limited amount of published literature relating to the use of exercise to treat mentally ill prisoners, those studies found were largely in favour of this approach. Buckaloo et al (2009) suggest that not only is exercise known to be effective in reducing depression, stress and anxiety in a prisoner population, it is also used as a coping strategy to deal with incarceration. Vaiciulis et al (2011) examined the impact of physical activity on the health of inmates in a Lithuanian prison. They found that levels of self-esteem were significantly higher in active prisoners compared to physically inactive prisoners. Battaglia et al (2015) conducted an exercise therapy programme amongst a prisoner population and found

that it was beneficial in reducing participants' levels of depression and anxiety. However, some authors, whilst acknowledging that organised aerobic exercise classes could be beneficial for depressed inmates, urge caution, pointing out that improvements in mood could simply be due to increased socialisation and a change in routine or environment (Genovese et al 1995; Blair 2009).

Exercise Referral

The use of Exercise Referral by General Practitioners (GP's) and many other health professionals to help patients who suffer from both physical and mental illnesses is popular since its inception in England in the 1990's. Currently, it is a concept which is used by healthcare professionals in countries such as Australia, New Zealand and the United States.

The popularity of such schemes increased greatly following the publication in 2006 of a report by the National Institute for Health and Clinical Excellence (N.I.C.E) which was a review of the effectiveness of Exercise Referral schemes to promote physical activity in adults. This document defined an Exercise Referral scheme as, "An intervention where there is a referral by an appropriate professional to a service where there is a formalised process of assessment of that person's need; the development of a tailored physical activity programme to meet that need; and monitoring of the individual's progress." (p3). Subsequent to the 2006 report, N.I.C.E. released a follow-up document in 2014 entitled "Exercise referral schemes to promote physical activity" which contained new evidence suggesting that exercise referral schemes have only marginal added effects relative to other methods of increasing physical activity such as advice-giving or providing information on how to access local facilities.

Exercise Referral was first introduced in Ireland on a pilot basis between 2003 and 2008. A national protocol was then developed in 2009 based on best practice taken from three large pilot schemes. To date, exercise referral has had a somewhat chequered history in Ireland, so much so, that in 2014 the Health Service Executive (HSE) commissioned a working group based in the School of Health and Human Performance at Dublin City University to develop a National Exercise Referral Framework. This review process was completed and a paper with several recommendations from the working group was submitted to the HSE in February 2015. To date, the working group is still awaiting a response from the HSE in relation to the future of Exercise Referral in Ireland.

Internationally, there is very limited evidence relating to the use of exercise referral in a prison setting. This study is the first to explore the effectiveness of such an intervention in the Irish prison system.

Methodology

The purpose of the study was to explore whether an exercise referral scheme can be an effective health promotion tool for Irish male prisoners with mental health problems.

A mixed methods approach was taken to gather symptom ratings via self-report scales for each participant before and after a novel exercise intervention and to then interview those

participants to shed further light on the process and qualitative findings. The authors felt the mixed methods approach was the most appropriate way to portray the effectiveness or otherwise, of an exercise referral scheme for prisoners with mental health problems and to obtain a more holistic picture of the problem being studied (Koller and Sinitisa 2009).

Prisoners partook in a purpose-designed 3-month exercise intervention in the prison gym, consisting of a mixture of light to medium resistance and cardiovascular exercises. After the participants finished the programme, they completed the self-report scales once more to give post-intervention ratings. When these scales were assessed and scored, a total of 11 semi-structured one to one interviews were conducted to elicit participants' opinions of and experiences during the intervention.

Ethical approval for the study was granted by the Irish Prison Service and Athlone Institute of Technology in late December 2013. All participants were issued with a letter explaining the procedure and given 24 hours before agreeing to sign a consent form if they wished to be involved. Assurances that confidentiality would be maintained were also provided to each participant and in addition, each participant was assigned a number so there were no identifying features on any of the self-rating scales.

Sample and Data collection

A purposive sampling (Polit and Beck 2004) approach was utilised in the male section of the prison which contained 78 prisoners. Sixty of the prisoners met the inclusion criteria for the study which were that they be male (permission was not granted for inclusion of females in this initial study for logistical, legal and security reasons), serving a sentence with a minimum length of two years, and be physically fit for inclusion on the exercise intervention (determined by a GP). Of these, 47 prisoners agreed to partake in the study and completed the initial pre-intervention symptom assessments. Seven of these prisoners did not qualify for the study as they were not sufficiently symptomatic. This left 40 participants who started the exercise intervention programme. Ten of these were unexpectedly transferred very early in the study to other prisons for operational reasons leaving a total of 30 who completed the programme.

The quantitative aspect of the study involved the use of pre- and post-intervention questionnaires from which participants' symptoms for depression, anxiety, stress, anger and self-esteem were measured.

The questionnaires were in the form of four well-established rating scales; **1)** the Depression, Anxiety and Stress scale or DASS-42, a 3 in 1 assessment scale by Lovibond and Lovibond, (1995), **2)** the Novaco Anger Scale (Novaco 1994), **3)** the Rosenberg Self-Esteem Scale (Rosenberg 1964) and **4)** the Zung Self-Rated Anxiety Scale (Zung 1971).

Qualitative data were gathered through post-intervention, semi-structured interviews with a subset (n=11) of the sample which fulfilled the qualitative aspect of the mixed methods design.

Data analysis

Quantitative data from the four symptoms assessment scales, one of which contained 3 sub-scales, generated raw score data for the 30 participants who completed the intervention in regard to levels of stress, anxiety (two different scales), depression, anger and self-esteem. These data were first of all arranged into a table aligning symptom scores for each participant, before and after the intervention (Table 1).

Resp.	Depression, Anxiety and Stress Scale (DASS 42) (Lovibond & Lovibond)						Novaco Anger Scale		Rosenberg Self-Esteem Scale ¹		Zung Anxiety Scale	
	Depression		Anxiety		Stress		Pre-	Post-	Pre-	Post-	Pre-	Post-
	Pre-	Post-	Pre-	Post-	Pre-	Post-						
1	31	13	33	5	39	21	76	63	16	15	37	41
2	4	0	8	4	15	10	76	51	19	20	41	32
3	38	0	34	6	41	5	77	50	12	18	53	33
4	34	0	27	0	35	3	74	31	10	21	45	36
5	28	4	9	0	25	4	84	33	13	24	41	38
6	11	0	11	5	14	2	89	34	15	18	34	31
7	4	0	7	0	32	12	77	60	20	20	37	37
8	36	24	31	24	35	21	60	48	19	15	51	36
9	7	0	9	2	29	9	41	35	14	20	35	32
10	0	0	4	1	2	3	85	67	20	20	34	36
11	19	1	13	2	16	2	42	21	18	20	38	31
12	27	3	23	13	34	16	81	86	21	25	51	43
13	23	7	21	3	23	8	64	47	21	28	29	38
14	10	1	8	4	16	6	52	26	15	22	42	36
15	3	0	3	2	5	2	76	27	20	20	31	32
16	0	0	13	8	19	9	86	84	29	30	31	35
17	32	7	29	12	37	16	82	53	15	24	46	40
18	22	2	19	3	29	8	79	40	14	20	34	32
19	4	7	5	0	25	24	51	46	22	24	36	38
20	11	2	1	1	12	9	52	68	18	22	31	36
21	19	25	27	23	22	28	72	55	17	14	45	39
22	9	3	23	10	30	14	67	56	16	14	45	49
23	35	0	22	5	31	12	66	40	17	16	37	31
24	30	0	19	0	25	1	26	16	16	24	52	35
25	21	4	23	6	28	9	77	33	17	28	40	39
26	1	0	10	3	11	4	45	9	27	20	39	41
27	24	6	24	4	33	16	72	53	14	21	47	31
28	14	4	8	5	26	15	90	64	18	16	49	42
29	4	2	7	2	25	11	78	74	23	20	25	36
30	12	0	12	5	15	4	49	54	17	16	39	40

Table 1. Pre- and post-intervention scores using DASS, Novaco's Anger Scale, Rosenberg's Self- Esteem Scale, and Zung's Anxiety Scale.

¹ A decrease in score equates to improvement in all symptoms except self-esteem where the opposite applies.

All scales have validated ranges of scores to categorise symptoms, for example, as mild, moderate or severe (category titles vary between scales). The next step was to arrange the pre- and post-intervention scores into those categories to add context to the raw data.

Ten randomly selected participants were also interviewed after completing the intervention to obtain rich, subjective data in regard to their experiences and opinions of the programme. Colaizzi's (1978) steps for qualitative content analysis were used to extract themes from the data.

Results

Wilcoxon's signed-rank test was used to measure if the generally obvious changes between pre and post intervention scores were significant. Strangroom (2015) states this test is suitable for evaluating data from a repeated-measures design in a situation where the prerequisites for a dependent samples t-test are not met. Z-values and p-values are calculated in each case. It is possible to use Wilcoxon's test as a one- or two-tailed statistic. In this study, deviations from the baseline scores are possible in either direction (two-tailed), i.e. a symptom score/rating can change positively, negatively or not at all (a tie).

Table 2 indicates that post-intervention, the scores for the DASS symptoms (Depression, Anxiety, Stress), and those for Anger, Self-esteem and Anxiety (Zung) all changed significantly.

	Sample (not-tied) ²	<i>z-value</i>	p-value	Significant
Stress (DASS)	30	-4.628	0.000	at $p \leq 0.01$
Anxiety (DASS)	29	-4.703	0.000	at $p \leq 0.01$
Depression (DASS)	28	-4.372	0.000	at $p \leq 0.01$
Anger	30	-4.391	0.000	at $p \leq 0.01$
Self-esteem	27	-2.607	0.0091	at $p \leq 0.01$
Anxiety (Zung)	29	-2.141	0.0324	at $p \leq 0.05$

Table 2 Wilcoxon's signed-rank test results for each of the 6 symptoms measured.

Within the DASS depression results, a major improvement was observed with the *normal* category increasing from 10 participants pre-intervention to 27 post-intervention, and 6 of the 8 participants who were in the *Extreme* category moving to *Normal*, as did all 5 who were initially scoring as *Severe*. Table 3 depicts all changes within this symptom scale with pre-intervention numbers per category on the left and post-intervention data on the right.

² Where a subject's difference score is zero - that is, if a subject has the same score in both treatment conditions - then the test discards the individual from the analysis and reduces the sample size.

DASS - Depression		Post-Intervention				
Pre-Intervention	Totals	Extreme	Severe	Moderate	Mild	Normal
Extreme	8	0	1	0	1	6
Severe	5	0	0	0	0	5
Moderate	3	0	(1)	0	0	2
Mild	4	0	0	0	0	4
Normal	10	0	0	0	0	10
Post-Intervention Totals		0	2	0	1	27

Table 3 DASS *Depression* subscale - numbers per category before and after intervention. Entries in parentheses represent participants who dis-improved after the intervention (n=1 or 3%).

Similarly improved scores were evident for other symptoms, depicted in tables 4-8.

DASS–Anxiety		Post-Intervention				
Pre-Intervention	Totals	Extreme	Severe	Moderate	Mild	Normal
Extreme	12	2	0	3	0	7
Severe	2	0	0	0	0	2
Moderate	5	0	0	0	1	4
Mild	5	0	0	0	0	5
Normal	6	0	0	0	0	6
Post-Intervention Totals		2	0	3	1	24

Table 4 DASS *Anxiety* subscale - numbers per category before and after intervention

DASS - Stress		Post-Intervention				
Pre-Intervention	Totals	Extreme	Severe	Moderate	Mild	Normal
Extreme	6	0	0	2	2	2
Severe	8	0	0	0	2	6
Moderate	7	0	(1)	1	0	5
Mild	4	0	0	0	0	4
Normal	5	0	0	0	0	5
Post-Intervention Totals		0	1	3	4	22

Table 5 DASS *Stress* subscale - numbers per category before and after intervention. Entries in parentheses represent participants who dis-improved after the intervention (n=1 or 3%).

Anger		Post-Intervention				
Pre-Intervention	Totals	Extreme	Marked	Normal	Low	RemLow
Extreme	3	0	1	1	0	1
Marked	12	(1)	0	4	3	4
Normal	7	0	0	1	4	2
Low	4	0	0	1	2	1
Remarkably Low	4	0	0	0	0	4
Post-Intervention Totals		1	1	7	9	12

Table 6 Novaco Anger Scale - Numbers per category before and after intervention. Entries in parentheses represent participants who dis-improved after the intervention (n=1 or 3%). Note that Novaco considers it possible to have too low or too high an anger score, hence, *normal* has a central position in the table.

Self-esteem		Post-Intervention		
Pre-Intervention	Totals	Extreme	Normal	Low
Extreme	2	1	1	0
Normal	22	(2)	18	2
Low	6	0	6	0
Post-Intervention Totals		3	25	2

Table 7 Rosenberg Self-esteem scale - Numbers per category before and after intervention. Entries in parentheses represent participants who dis-improved after the intervention (n=1 or 3%). Again, it is possible to have too low or too high a self-esteem score, hence, *normal* has a central position in the table.

Zung anxiety scale		Post-Intervention			
Pre-Intervention	Totals	Extreme	Marked	Mild/Mod	Normal
Extreme	0	0	0	0	0
Marked-Severe	0	0	0	0	0
Mild-Moderate	10	0	0	1	9
Normal	20	0	0	0	20
Post-Intervention Totals		0	0	1	29

Table 8 Zung anxiety scale - Numbers per category before and after intervention.

One-to-one, digitally recorded, semi-structured interviews were carried out with 10 (33.3%) of the participants who completed the exercise programme. This sample was selected randomly from those who were willing to be interviewed (n=29). Topics included opinions

and experiences of the programme, awareness of symptoms prior to and after the intervention, and participants' opinions in regard to changes indicated in the rating scales.

Most interviews were about 15 minutes in duration, as participants tended to answer questions quite briefly, elaborating when prompted with sub-questions. However, a lot of rich data were elicited through these interviews. Colaizzi's 1978 framework for content analysis of qualitative data was utilised to develop themes.

The four overarching themes all had positive connotations; improved mood; enhanced daily routine, greater self-esteem and feeling physically healthier.

Improved mood

In relation to their mood, interviewees were generally positive and reported that, following the exercise intervention they were less stressed or depressed.

"Since I've been doing the programme (EI) I've found that I've gone a lot more relaxed and things have got a lot better."

"It exercises the mind as well as the body, so it is good if you are any way feeling low a bit of exercise can eh, take the stress out of the day." (Respondent No 24)

"A lot has happened me, I lost my mother and my father and that, and two of my brothers and that, and there was a lot of pressure sometimes on me and by be going down to going to the gym and to releasing all the anger I felt good like and the depression started going away you know." (Respondent No 18)

Enhanced daily routine

Respondents were unanimously of the opinion that the exercise intervention afforded them more time out of their cells and consequentially their daily routine was more tolerable.

"Eh, I found the programme very good, to get out of the eh, the cell every day, get down and have a bit of craic with the lads an all, you know, instead of sitting in the cell thinking all sorts from the outside you know, all of that, yeah, I found it (EI) very good, yeah." (Respondent No 3)

"I enjoyed it, it gave me great confidence in myself. It got me out of my cell and gave me routine, helped me mix with other lads, even some I didn't think I'd talk with 'cos of the feud and that. I got pulled into the XXXXX row and some of the fighting in here is from the outside." (Respondent No 5)

Greater self-esteem

It was no surprise given the environment and macho-type culture which pervades within the prison that some participants chose to focus on how the exercise intervention led to them noticing a change in their body shape and, in turn, how this brought about more self-confidence and self-esteem.

“Em, my self-esteem would be because I looked healthier, em, little things like skin or even running out in the yard or playing football you know, you’re not out of breath and ya gain a bit of muscle on ya so it gives ya a bit of self-esteem.” (Respondent No 11)

“I used to look forward to it and could see a change in myself. I lost a stone doing it, I went from 15 stone to 14 and I could see my shoulders were getting wider. That all gave me more confidence in myself.” (Respondent No 5)

For some, the improvement in self-esteem led to more motivation to do things they wouldn’t have bothered with prior to the exercise intervention.

“I have more motivation to eh, get up and do stuff, and if I, if I miss going to the gym or anything like that I do get a little anxious over it ‘cos eh, I like getting up and going out now you know. The last time (prior to EI) it wouldn’t a bothered me at all.” (Respondent No 30)

Two participants, subjects 13 and 25, moved from Normal self-esteem levels pre-intervention to Extreme self-esteem levels post-intervention. This, drop in self-esteem score was not examined in the qualitative data analysis as neither of these individuals were randomly selected to participate in the interview process the authors have no substantial evidence as to why this was the case.

Feeling physically better

Most of the subjects indicated that, due to their participation in the exercise intervention, they felt healthier. Their responses alluded to various aspects of general wellbeing such as improved energy, better sleep patterns and reduced drug use.

“Because I went down to the gym I did the eh, the course, it gave me something to do, kept me busy and em got me healthier, thinking about healthy stuff and so even going down on visits with my family they’d tell me I look different and that’s all thanks to the gym.” (Respondent No 11)

“Em, well it was down to eh, getting a routine, going to the gym, keeping fit, eh, exercise is good to clear the head, plus the fact you are meeting other people in the gym, you’re burning off a lot of excess energy so that helps you sleep at night.” (Respondent No 24)

Conclude the qual section with a summary statement

Having analysed the qualitative data the authors are satisfied that the majority of participants gained very positive experiences from their involvement in the exercise intervention. This conclusion is further supported by several links which show that evidence unearthed in the qualitative themes concurs with evidence found in the descriptive and statistical tests. For example, when analysing Theme 1, Mood, it was found that participants mentioned an improvement in mood 8 times, reduced stress 8 times, reduced depression 5 times, reduced anxiety 4 times and reduced anger 4 times. This is congruent with the quantitative results which show increases and reductions in each of these areas.

Discussion

The overriding aim of this research study was to explore the effectiveness of an Exercise Referral scheme as a health promotion intervention for Irish male prisoners with mental health problems, using a mixed methods design. The literature confirmed that imprisoned people have extraordinarily high levels of poor mental health and indicated several reasons why this is the case, highlighting social, economic and genetic circumstances as some of the main causes (Mannocci et al 2015; Hoke 2015; Samele et al 2016). It is clear from the literature reviewed that prisoners are known to experience mental illness to varying degrees and with many consequences, which range from mild anxiety and depression, to chronic self-harm and even suicide.

The findings in this research concur with several previous studies (Penedo and Dahn (2005), Warburton et al (2010), Booth et al (2012), Scheewe et al (2013) and Frühaufa et al (2016), Maier & Jette (2016), Melo et al (2016) and Kvam et al 2016) which suggest that exercise is beneficial to individuals who suffer from mental health problems such as depression, anxiety and low self-esteem. This study also assessed the impact of an exercise intervention on anger, with this also proving to be very significant. .

The pre-intervention data collection showed that mental health issues represent a significant entity in this prison campus. Out of a population of 78 prisoners, 40 were assessed as having symptoms sufficient to meet the inclusion criteria. Seven others did not have sufficient symptomatology. The remaining 31 were ineligible for inclusion due either to the possibility of early release or unwillingness to be involved. Given that 40 of the 47 assessed participants were symptomatic, it is reasonable to expect that at least some of the remaining 31, had they been assessed, would have scored similarly. This strongly supports the findings of other studies such as (Prins 2014) that claim mental health problems are a significant entity within prison systems.

Post-intervention scores for the 30 participants who completed the exercise intervention indicate that there may be significant benefits for mentally ill prisoners who engage in physical exercise.

Findings are further supported by participants' comments at interview. They were unanimous in their support for the intervention, so much so that all themes generated had positive

connotations. When the quantitative and qualitative results of this study are viewed together, Exercise Referral appears to be a significantly effective health promotion intervention for Irish male prisoners with mental health problems. This combination of positive results gives further credence to the authors' decision to use a mixed methods approach.

Though not an interview question, 4 participants reported that, as a result of their involvement in the programme, they had a reduced tendency to be violent or angry whilst 3 participants reported a reduced desire to use illicit drugs. Drug use and violence in prisons go hand-in-hand and are amongst the primary causes of disruption to effective prison management. Bell and Lindekugel (2015) suggest that despite the best efforts of prison management and staff, violence will occur. Walters and Crawford (2013) state younger inmates with a history of criminal violence are most likely to engage in violence in prisons. In 2015, the IPS launched a new initiative to combat violence and drug use in prisons by introducing a confidential telephone number in an attempt to gather information which may help to reduce levels of violence and drug use in Irish prisons. The findings referred to above may therefore complement this new initiative. Anything which has potential for reducing these harmful, negative factors in Irish prisons can only have positive outcomes, not only for prison managers, but for prisoners, prison staff, the families of prisoners and prison staff and indeed, the greater community.

There are some limitations of this study design. Operational circumstances within the prison at the start of this study prevented the authors from accessing a larger sample. A control group would add greatly to the study but this was not possible within a single prison setting. The possible influence of extraneous variables such as increased attention and social contact, and more time out of one's cell may have contributed to improved symptom scores as much as the exercise intervention in this study. This possibility was recognised from the outset but the authors proceeded because the aim was to test if an exercise referral package (and all that inevitably goes with that) would make a difference for symptomatic prisoners.

It is hoped that this study will act as a catalyst and inspire further investigation into the use of exercise as a health promotion intervention for male and female prisoners in Ireland and elsewhere, who suffer from mental health problems.

Conclusions

The findings in this research concur with much of the literature reviewed. Penedo and Dahn (2005), Warburton et al (2010), Booth et al (2012), Scheewe et al (2013), Frühauf et al (2016), Maier & Jette (2016), Melo et al (2016) and Kvam et al (2016) report that exercise is beneficial to individuals who suffer from mental health symptoms such as depression, anxiety and low self-esteem. In addition, this study reported on the impact of an exercise intervention on anger in a sample of prisoners from Ireland. These findings proved significant in light of the setting of this study. Thus, this study is worthwhile in that it presents a platform for further work in this domain. The work could include expanding the role of exercise intervention for prisoners presenting with mental health symptoms to other prisons in Ireland. There is also scope for investigating the impact of such positive interventions on prisoners for prison staff and the prison system as a whole.

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