



**AN EVALUATION OF
ROLLIN' WITH THE PUNCHES:**

A Boxing
Intervention For
Mental Health

May 2023

AN EVALUATION OF ROLLIN' WITH THE PUNCHES:

A Boxing Intervention for Mental Health

May 2023

Dr. Stephen Hills

Dr. Nwando Onuigbo-Chatta

This research was commissioned by Fight 4 Change, funded by London Metropolitan University and undertaken by the Performance with Purpose Research Centre.

London Metropolitan University Performance with Purpose Research Centre

London Metropolitan University's Centre for Performance with Purpose is located within the Guildhall School of Business and Law. The Centre focuses on research that addresses real societal challenges, such as inclusion, social value and equity, and applies business and management techniques to support effective organisational performance in tackling social problems. For more information please visit: <https://www.londonmet.ac.uk/research/centres-groups-and-units/performance-with-purpose-research-centre/>

Correspondence should be addressed to: s.hills@londonmet.ac.uk

© 2023 London Metropolitan University

Graphic design by Mason Riley, London Metropolitan University

Foreword



We are delighted to present the Rollin with the Punches research report. Since 2009 when Fight for Change was established, we instinctively knew our work was having a positive impact on people's mental health and wellbeing, but did not have the tools and resources to independently verify our work. This report goes some way to uncovering how boxing contributes to positive mental health and how if harnessed correctly boxing can reduce the effects of debilitating conditions such as anxiety, stress and depression.

The emergence and growth of social prescribing demonstrates the recognition and need for the voluntary sector to support the NHS and other health bodies deliver innovative alternatives to clinical interventions. We hope that this report positions boxing and wider physical activity blended with mentoring and personal development opportunities as a credible option for commissioners and practitioners in the future. I'd like to thank Comic Relief for investing in this work and trust the findings, learnings and recommendations are taken onboard for future work in the mental health and sport space.

May I extend my thanks to all the staff at Fight for Change whose tireless work and approach is vital to all we do. I'd also like to thank Dr Stephen Hills and his research team for embedding themselves in the charity over the last three years. Finally, to the participants of Rollin with the Punches who took part in the study thank you for your efforts and honesty in the data collection. It has been a great pleasure to see so many of you thriving and moving forwards positively.'

Rebecca Donnelly MBE

Chief Executive, Fight 4 Change



CONTENTS

01 EXECUTIVE SUMMARY	5
02 SOCIAL PROBLEM	14
03 BACKGROUND	16
04 THE INTERVENTION	20
05 RESEARCH PROCESS	27
06 PARTICIPANT DEMOGRAPHICS	32
07 RELATIONSHIPS FINDINGS	43
08 SELF-BELIEF FINDINGS	46
09 MENTAL HEALTH & WELLBEING FINDINGS	49
10 PHYSICAL ACTIVITY & HEALTH FINDINGS	53
11 RANKING OF EFFECTS	56
12 QUALITATIVE FINDINGS	58
13 CONCLUSIONS & IMPLICATIONS	64
14 REFERENCES	67
15 APPENDIX I	73
16 APPENDIX II	86
17 APPENDIX III	88

EXECUTIVE SUMMARY

01



Executive Summary

Social Problem

- In any given week in England, one in six people report experiencing a common mental health problem, such as anxiety or depression (McManus, et al., 2016).
- Two in five of GP consultations are about mental health (Mind, 2018).
- The total economic and social cost of mental illness is over £11 billion a year (Naylor, et al., 2016).
- On average, mental health sufferers die 15 to 20 years earlier than those who do not suffer from mental health problems (Thorncroft, 2013).
- Minority groups are disproportionately affected by mental health problems in England (McManus, et al., 2016; NHS, 2017; Public Health England, 2019; ONS, 2019).

Background

- The traditional medical model advocates treating mental disorders in the same way as physical diseases using medication (Deacon, 2013).
- Such a silo approach fails to identify and treat the physical and social problems associated with mental illness and does not reflect its complexity (Deacon & McKay, 2015), which requires that mental health, physical health and social and emotional wellbeing be treated holistically (Pasquali, et al., 1989; Ohara-Hirano, et al., 2004; Naylor, et al., 2016).
- The stigma of mental health inhibits sufferers from accessing mainstream treatments (Brodie, et al., 2011).
- Physical activity is universally acknowledged to be an important part of healthy functioning (Bailey, et al., 2013).
- Physical activity, if well designed, has been conclusively found to have beneficial effects for mental health and social and emotional wellbeing (Penedo & Dahn, 2005; Richardson, et al., 2005).
- However, mental health sufferers face complex barriers in accessing physical activity (Paluska & Schwenk, 2000), requiring a tailored physical activity intervention that is accessible to those with mental illness (Richardson, et al., 2005).

The Intervention

- Rollin' with the Punches is a boxing-based intervention, designed to treat mental health, physical health and social and emotional wellbeing holistically as an alternative to clinical and medical intervention, as part of a social prescription agenda.
- Rollin' with the Punches designed boxing so that the barriers faced by the mentally ill are removed so that they can access physical activity and the mental and physical health benefits that come with being physically active.
- So to overcome the barrier of stigma (Feldman & Crandall, 2007) and lack of social support (Daumit, et al., 2005; McDevitt, et al., 2006; Usher, et al., 2007) Rollin' with the Punches provided a supportive mental health community.

- So to overcome the barriers of low confidence (Troost, et al., 2002; Usher, et al., 2007) and fatigue (Usher, et al., 2007) Rollin' with the Punches coaches monitored participants on an individual basis and building the intensity of their training gradually.
- So to overcome the barriers of lack of motivation and fatigue (Usher, et al., 2007), Fight 4 Change coaches served as enthusiastic, knowledgeable and supportive physical activity leaders able to motivate participants.
- So to further overcome the barrier of lack of motivation (Usher, et al., 2007) Rollin' with the Punches incorporated goal-setting sessions and follow up sessions to monitor participants progress against goals.
- Rollin' with the Punches used boxing as an analogy to teach a curriculum of skills and values that can be extended and applied to other areas of life so to reduce the vulnerability of the mentally ill.
- Specifically, a boxing game, drill or technique was designed to reflect a principle or idea associated with a life skill or value.
- Through the boxing-based game, drill or technique, participants gained an understanding of the principle or idea as it relates to boxing.
- Following the game or drill, participants were asked to reflect on what they have experienced and to articulate the principle or idea.
- Once participants have understood the principle or idea within a boxing context, they are asked to reflect upon other contexts where that principle or idea would be important and useful to them.
- To create a sense of community through a WhatsApp group where shared experience support and difficulties could be discussed as well as a way of communicating volunteering opportunities and courses to participants.
- To create volunteering opportunities and events where participants can have a purpose, utilize their skills, meet others and gain a sense of normality.

Research Questions

1. What is the effect of Rollin' with the Punches on relationships, self-belief, mental health and wellbeing, physical activity and health outcomes?
2. How does Rollin' with the Punches affect relationships, self-belief, mental health and wellbeing, physical activity and health outcomes?

Research Process

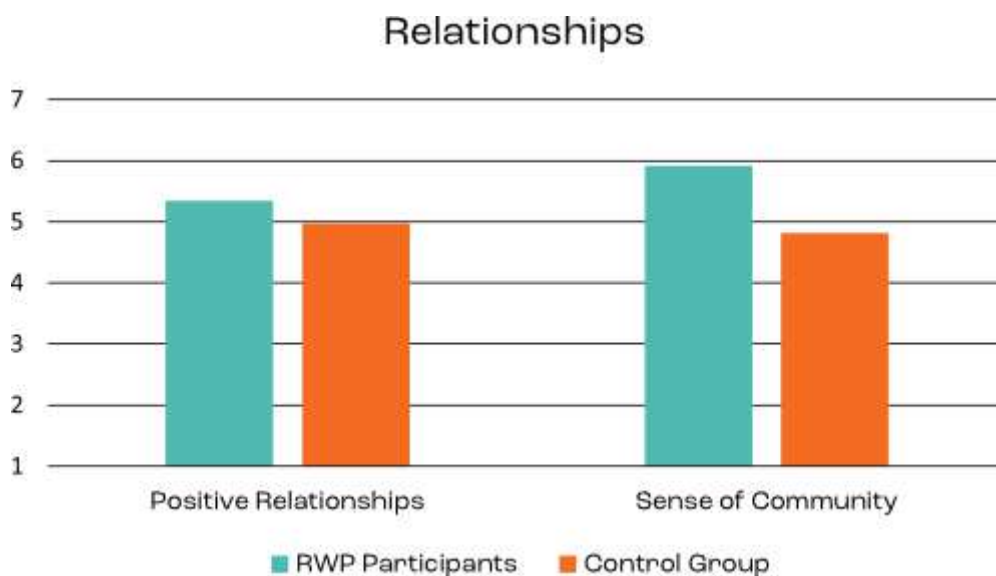
- The research questions were answered by a mixed-methods approach with a quasi-experiment design to quantitatively measure the effect of the programme and qualitative data to interpret how any effects were achieved.
- Outcomes were measured using an online questionnaire and propensity score matching was used to match experimental and control units from which effect was determined using repeated measures t-tests.
- Qualitative data on programme mechanisms and processes was collected via observation and semi-structured interviews, the data from which was analysed using thematic analysis.

Quantative Findings

Relationships

	RWP Participants		Control Group		Mean Difference
N	48		48		
	Mean	SD	Mean	SD	Mean
Positive Relationships	5.34	1.17	4.97	1.22	+0.37
Sense of Community	5.92	0.98	4.81	1.11	+1.11*

*Statistically significant effect, $p < 0.01$

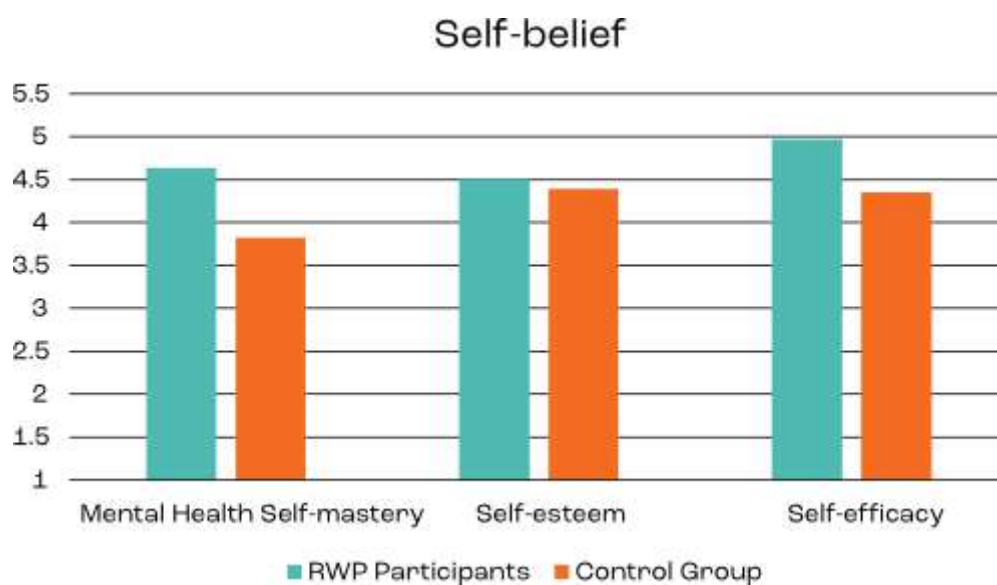


Self-belief

	RWP Participants		Control Group		Mean Difference
N	48		48		
	Mean	SD	Mean	SD	Mean
Mental Health Self-mastery	4.64	1.36	3.82	0.94	+0.83*
Self-esteem	4.51	0.86	4.39	0.99	+0.12
Self-efficacy	4.51	1.21	4.35	1.06	+0.61**

*Statistically significant effect, $p < 0.001$

**Statistically significant effect, $p < 0.01$



Mental Health and Wellbeing

	RWP Participants		Control Group		Mean Difference
N	48		48		
	Mean	SD	Mean	SD	Mean
Health Satisfaction	5.21	1.34	4.58	1.4	+0.63*
Life satisfaction	4.81	1.41	4.23	1.45	+0.58*
Mental Health	4.64	1.14	3.99	1.11	+0.65**
Mental Wellbeing	5.16	1.11	4.22	1.3	+0.94***
Coping Self-efficacy	4.78	1.2	4.23	1.1	+0.55*
Stress	4.01	1.27	4.46	1.06	-0.46*
Anxiety	3.49	1.37	4.31	1.02	-0.82**

*Statistically significant effect, p < 0.05

**Statistically significant effect, p < 0.01

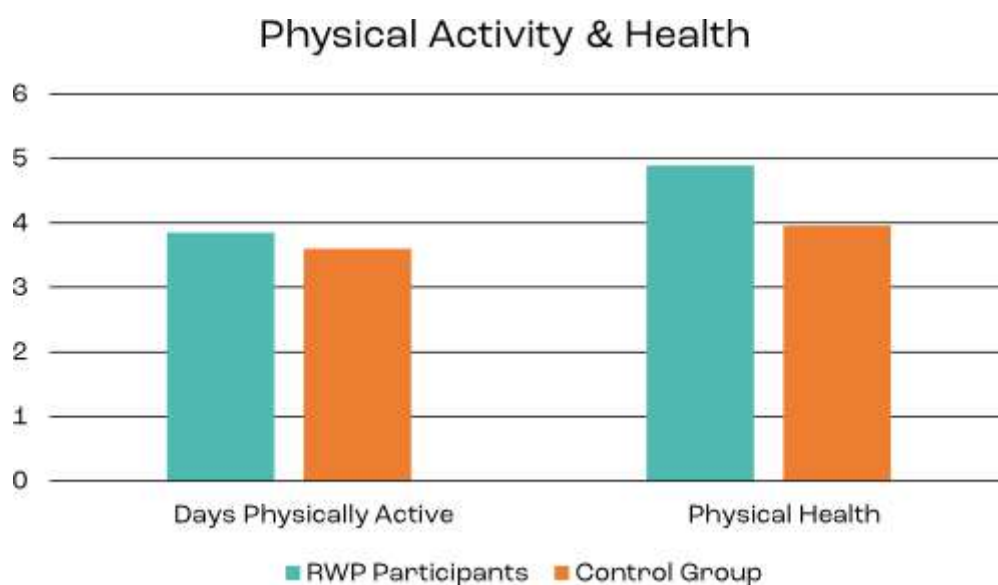
***Statistically significant effect, p < 0.001



Physical Activity & Health

	RWP Participants		Control Group		Mean Difference
	Mean	SD	Mean	SD	Mean
N	48		48		
Days Physically Active	3.85	2.03	3.6	1.77	+0.25
Physical Health	4.89	1.38	3.96	1.08	+0.93*

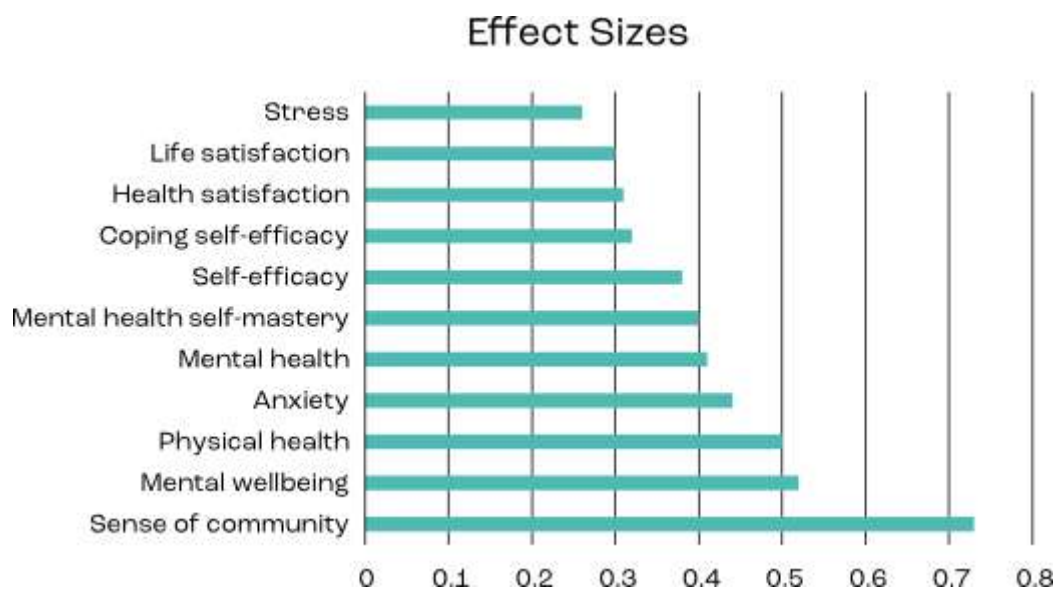
*Statistically significant effect, $p < 0.001$



Ranking of Effects

- Rollin' with the Punches had a positive effect on 11 out of 14 variables.

Rank	Variable	d
1.	Sense of community	0.73
2.	Mental wellbeing	0.52
3.	Physical health	0.5
4.	Anxiety	-0.44
5.	Mental health	0.41
6.	Mental health self-mastery	0.4
7.	Self-efficacy	0.38
8.	Coping self-efficacy	0.32
9.	Health satisfaction	0.31
10.	Life satisfaction	0.3
11.	Stress	-0.26



Qualitative Findings

- When participants joined the programme they were in a fragile state seeking alternative treatment to the medication they were taking of the substances through which they were self-medictaing.
- The programme made participants happy and confident with something to look forward to and who are less reliant upon medications and other substances.
- The programme was effective because it facilitated a caring sense of community with people on a similar path and caring coaches.
- Boxing worked as a stimulant to improve mental health and as an alternative for unhealthy behaviours.
- Boxing worked as an outlet for anger and stress.
- Boxing worked as an analogy to teach skills and values that made participants less vulnerable.

Conclusions

- This study has conclusively evidenced the effectiveness of Rollin' with the Punches as an intervention for tackling mental health problems, whilst simultaneously improving the physical health and social and mental wellbeing of participants.
- This study adds to the evidence that physical activity is an effective non-medical intervention for mental health problems (Penedo & Dahn, 2005; Richardson, et al., 2005)
- Boxing is a particularly effective form of physical activity because of its ability to serve as an outlet for anger and stress.
- Boxing also provides a rich tapestry of analogies to teach skills and values for boxing that can be reframed to make participants fighters able to cope with the challenges of their mental illness.

SOCIAL PROBLEM

02



Social Problem

In any given week in England, one in six people report experiencing a common mental health problem, such as anxiety or depression (McManus, et al., 2016) and two in five of GP consultations are about mental health (Mind, 2018). The total economic and social cost of mental illness is over £11 billion a year (Naylor, et al., 2016).

Mental Health

On average, mental health sufferers die 15 to 20 years earlier than those who do not suffer from mental health problems (Thorncroft, 2013). Mental illness in itself is generally more debilitating than most chronic physical conditions, resulting in sufferers being some of the most vulnerable people in society. Furthermore, minority groups are disproportionately affected by mental health problems in England. Black or Black British people are more likely than White people to experience a common mental health problem in any given week (McManus, et al., 2016) and more than four times more likely to be detained under the Mental Health Act than White people (NHS, 2017). Adults in the poorest fifth of the population are twice as likely to be at risk of developing mental health problems as those with an average income (Public Health England, 2019) and disabled adults are more likely to report poorer wellbeing levels than non-disabled people (ONS, 2019). People who identify as LGBTQ+ are two to three times more likely to report having a longstanding mental health problem than heterosexual people (Elliott, et al., 2015).

The most common mental health problems are depression and anxiety. Depression is a disorder of impaired emotion regulation associated with difficulties in cognitive control (Joorman & Gotlib, 2009) that leaves sufferers feeling sad, tearful, unable to cope, hopeless, despairing, guilty, worthless, unmotivated, exhausted, irritable and isolated (NHS, 2017). It makes everyday tasks, such as making a decision, harder and life seem less worthwhile, at its worst making sufferers suicidal, giving up on the will to live (NHS, 2017). Sufferers of anxiety experience strong feelings of unease, worry and fear as a response to feeling threatened (NHS, 2017). It involves constant worrying about things that are a regular part of everyday life, or even about things that aren't likely to happen (NHS, 2017). Other symptoms include feeling tense, feeling nervous, feeling 'on edge', fearing the worst, feeling judged, dwelling on negative experiences, feeling restless, feeling irritable and not being able to concentrate and feeling numb (NHS, 2017).

Physical Health

Those suffering with mental illness are at greater risk of physical health problems (Harris & Barraclough, 1998, Naylor, et al, 2016). Mental illness greatly increases the risk of physical illness because sufferers face barriers in living a healthy lifestyle and being physically active, such that they are more likely to lead a sedentary lifestyle (Richardson, et al., 2005; Usher, et al., 2007; Paluska & Schwenk, 2000). Furthermore, people with mental health problems are more likely to have a poor diet, to smoke and to drink too much alcohol, which is confounded by the side effect of mental health medicine to increase weight and risk of obesity (Richardson, et al., 2005).

Social and Emotional Wellbeing

In addition to being at greater risk of physical illness, mental health sufferers also face greater threats to their social and emotional wellbeing. Misunderstandings of society about mental disorders result in stigma (Rusch, et al., 2005), which in turn can lead to family discord, job discrimination and social rejection (Feldman & Crandall, 2007). This stigma denies the mentally ill opportunities to work, to live independently and to pursue other goals, resulting in mental health sufferers often turning to substance abuse (Connigan, 2005). This problem is confounded when those suffering with mental illness accept the common prejudices about mental illness and turn against themselves, leading to a loss of self-esteem (Rusch, et al., 2005), which only deepens social isolation and mental health problems. Both public and self-stigma inhibits empowerment of the mentally ill and limits their ability to access treatment (Rusch, et al., 2005).

BACKGROUND

03



Background

The traditional medical model or biomedical model advocates treating mental disorders in the same way as physical diseases using medication (Deacon, 2013). Such a silo approach fails to identify and treat the physical and social problems associated with mental illness and does not reflect its complexity (Deacon & McKay, 2015), which requires that mental health, physical health and social and emotional wellbeing be treated holistically (Pasquali, et al., 1989; Ohara-Hirano, et al., 2004; Naylor, et al., 2016). Furthermore, the stigma of mental health inhibits sufferers from accessing mainstream treatments (Brodie, et al., 2011). There is a growing body of evidence that physical activity is an effective way to support good mental health and social and emotional wellbeing, further to long held understanding that physical activity supports physical health.

Physical Activity & Physical Health

Physical activity is universally acknowledged to be an important part of healthy functioning (Bailey, et al., 2013). According to Warburton et al. (2006) the evidence of the effectiveness of regular physical activity in primary and secondary prevention of several chronic diseases, such as cardiovascular disease, diabetes, cancer, hypertension, obesity and osteoporosis, and countering premature death is irrefutable. As physical activity increases, so do health benefits (Janssen & LeBlanc, 2009). As previously stated, physical activity causes the body to produce the stress hormone of cortisol, which forces the body to adapt to regulate cortisol levels, which if unregulated increases the risk of heart disease, high blood pressure and lowered immune response (Jin, 1989; Chandola, et al., 2008). Physical activity requires organs, bones and muscles to work more, which in turn strengthens them, and requires that our body takes in and uses oxygen, improving our ability to transport and use oxygen thus reducing fatigue (Myers, 2003). Furthermore, physical activity increases heart rate, which reduces body fat (Moore, et al., 2003). As well as mental and physical health, physical activity has been found to support social and emotional wellbeing.

Physical Activity & Mental Health

Physical activity, if well designed, has also been conclusively found to have beneficial effects for mental health (Penedo & Dahn, 2005; Richardson, et al., 2005). Specifically, physical activity has been found to play an important role in the management of mild-to-moderate health diseases, reducing depressive symptoms significantly and also reducing anxiety and panic disorder symptoms (Taylor & Dear, 1981; Stephens, 1988; Fox, 1999; Paluska & Schwenk, 2000). Furthermore, physical activity is associated with general well-being and positive mood (Stephens, 1988; Fox, 1999). Physical activity is a stressor that causes the body to produce the stress hormones of cortisol and adrenaline, which forces the body to adapt to deal with these stressors by controlling cortisol levels, which in turn leads to physically active people building up resilience to stress over time (Pederson & Ullum, 1994; Nabkasorn, et al., 2006). Furthermore, physical activity causes the brain's chemistry to change through the release of endorphins, which calm anxiety, lift mood and can break up racing thoughts because as the body tires, so does the mind, bringing calmness and clearer thinking (Stephens, 1988; Camacho et al., 1991; Pederson & Ullum, 1994; Paluska & Schwenk, 2000; Strawbridge, et al., 2002; Peluso & Andrade, 2005).

Physical Activity & Social & Emotional Wellbeing

Further to physical and mental health benefits, physical activity can also improve social and emotional wellbeing. Physical activity and exercise have found to be effective in alleviating low self-esteem and social withdrawal (Richardson, et al., 2005). Improved body image and fitness levels through physical activity can improve self-esteem, which has a protective effect that increases life satisfaction and increases resilience to stress (Fox, 1999; Biddle & Asare, 2011). As part of sport participation, a reinforcing and encouraging coaching style develop self-esteem and self-efficacy in participants (Smith & Smoll, 1990) so to overcome the loss of self-esteem that comes with accepting common prejudices about mental illness (Rusch, et al., 2005).

Barriers to Physical Activity for the Mentally Ill

Mental health sufferers face complex barriers in accessing exercise (Paluska & Schwenk, 2000):

Stigma & Lack of Social Support Barrier: The stigma associated with mental illness makes sufferers feel that others don't understand their needs or will be judgmental because of their mental health problem (Feldman & Crandall, 2007), thus they feel they will not be accepted into physical activity settings. Lack of regular social contact appears to be a common correlate of inactivity in this population (Daumit, et al., 2005; McDevitt, et al., 2006; Usher, et al., 2007).

Confidence Barrier: Low self-efficacy is one of the strongest determinants of inactivity in general (Troost, et al., 2002). Those with mental health problems can lack the confidence to try something new or meet new people, especially when feeling sad or stressed (Usher, et al., 2007).

Fatigue & Motivation Barriers: In research by Usher et al. (2007), the most frequently reported reason for those suffering from mental illness not being physically active was fatigue. Having a mental health problem or taking medication can cause tiredness, which can negatively influence motivation to be physically active. Bad weather is also cited as a barrier for not being physically active (Usher, et al., 2007), suggesting that those suffering from mental illness have are lacking drive and motivation to be physically active.

Body Image Barrier: A specific confidence-related barrier to physical activity is body image, which is particularly an issue for female mental health sufferers because their sedentary lifestyle and poor diet can create a poor body image that makes people too embarrassed to exercise (Richardson, et al., 2005).

Given the effectiveness of physical activity in improving not just physical health, but also mental health and social and emotional wellbeing, a tailored physical activity intervention for mental health sufferers that overcomes these complex barriers is of the utmost importance (Richardson, et al., 2005).

Designing Sport for Mental Health

Sport is a form of physical activity that has the potential to act as a treatment for mental health sufferers. However, Coalter (2013) warns against over-dependence "on the supposed inherent properties of sport to achieve desired outcomes" (p. 609). Rather, according to Bruening et al. (2013), sport should be intentionally designed in order to achieve change. According to Coalter (2013), participation in sport is only a necessary but not sufficient condition for change, such that designers of sport-based interventions need to consider the sufficient conditions (Coalter, 2013). For example, Hills et al. (2018) describe how football was intentionally designed, using it as an analogy whereby principles were first taught in the context of football before being applied to other areas of participants' lives through reflection so to teach life skills and redefine morale values.

Boxing and Mental Health

There is a growing body of evidence of the effect of boxing programmes on mental health. The majority of this evidence comes from boxing programmes designed to tackle other social problems, but measured mental health alongside other outcomes. Van Inglen (2011) qualitatively studied a boxing program for survivors of violence using observations, a focus group and interviews. Participants reported that boxing served as a safe emotional outlet and release of stress and anger for them. Schultz et al. (2013) qualitatively studied the benefits of a boxing-oriented exercise intervention

for obese adolescent males, using semi-structured interviews. Participants reported being calmer, less aggressive and more confident. Morton et al. (2019) qualitatively studied the benefits of the Boxing Clever programme, a fitness and education rehabilitation programme, for substance abusers, using focus groups. Participants reported improved mood, abstinence or reduced substance use, self-growth and self-awareness. Participants believed that boxing was an effective vehicle for change because a boxer identity was deemed as a desirable alternative to an addict identity.

Further to this qualitative evidence, which is limited in measuring effect, there have been experimental designs measuring the effect of boxing programmes on mental health outcomes, but focused on other social problems. Lyon et al. (2020) studied the effect of the Left/Write/Hook boxing programme, which combined writing therapy and non-contact boxing, on assertiveness, post-traumatic stress disorder symptoms, wellbeing, depression, anxiety and stress for female survivors of childhood sexual abuse, using a mixed-methods design, including a pre-post quasi experiment. They found a significant effect on reduced post-traumatic stress disorder (PTSD) symptoms, improved well-being and reduced depression symptoms, but no statistically significant effect on anxiety or stress. Gammage et al. (2021) studied the effect of the Shape Your Life boxing programme on physical and mental health, quality of life, mastery, resilience, self-esteem, physical self-efficacy, social conflict and financial strain for female survivors of gender-based violence, using a pre-mid-post quasi-experiment. They found a significant effect on physical and mental health, quality of life, mastery, resilience, self-esteem, physical self-efficacy and social conflict. The use of pre-post experimental designs without a control group are limited in terms of causal inference because time is a confounding variable and other factors may have influenced outcomes during the time that participants were on the programmes. Most robustly, Cheema et al. (2015) studied the effect of high-intensity boxing training on Body Mass Index (BMI) and health-related quality of life for adults with abdominal obesity, using a randomized controlled trial with a control condition of moderate-intensity brisk walking. They found a significant effect on reduced BMI and improvement in the physical functioning, general health and vitality domains of health-related quality of life.

Ghaffar et al. (2019) studied the effect of the Rock Steady boxing programme on depressive symptoms and Parkinson's symptoms for patients with Parkinson's disease, using a pre-post quasi experiment. They found a significant effect on improved depressive symptoms and improved Parkinson's symptoms. Hermanns et al. (2021) also studied the effect of the Rock Steady boxing programme on depressive symptoms and Parkinson's symptoms for six patients with Parkinson's disease, using a mixed-methods design, including a pre-post quasi experiment. They found a significant effect on reduced depressive symptoms and improved quality of life. Caregivers and participants reported that participants' ability to perform activities of daily living improved and reduced stigma.

Boxing and Mental Health Sufferers

Only a single study has looked at boxing programmes specifically designed to treat mental health sufferers. Hefferon et al. (2013) qualitatively studied the benefits of boxercise for individuals with mental health problems, the majority of whom had anxiety or depression, using a focus group. Participants reported reduced stress, less ruminating, improved concentration, social development, an improved sense of purpose and an improved sense of community.

Gap in the Literature

This study is the first to study the effect of a boxing programme on mental health for sufferers of mental health problems using an experimental design. Although this study did not use a randomised controlled trial, which is considered the gold standard of causal inference (Cartwright, 2007), like Cheema et al. (2015), this study attempts to mimic a randomised controlled trial via a quasi-experiment that creates a control group by matching a convenience sample of non-participating mental health sufferers on measured covariates.

THE INTERVENTION

04



The Intervention

Rollin' with the Punches is a boxing-based intervention, designed to treat mental health, physical health and social and emotional wellbeing holistically as an alternative to clinical and medical intervention, as part of a social prescription agenda. Rollin' with the Punches uses boxing, circuit training, volunteer/social action components and on-demand counselling services that offer a bridge for participants to develop new networks, become less isolated, enable a high degree of social mixing or access additional support to sustain better mental health outcomes. Rollin' with the Punches works with mental health organisations, who refer patients with mental health problems onto the programme. These partner organisations include SLAM – South London and Maudsley (LEO team), Harbour, Lambeth Early help, CAMS - Children and Adolescent Mental Health Services, Lambeth GPs and other local GPs. Rollin' with the Punches leveraged boxing in two distinct ways:

- Rollin' with the Punches designed boxing so that the barriers faced by the mentally ill are removed so that they can access physical activity and the mental and physical health benefits that come with being physically active.
- Rollin' with the Punches used boxing as an analogy to teach a curriculum of skills and values that can be extended and applied to other areas of life so to reduce the vulnerability of the mentally ill.

Punching Through Barriers

The complex barriers faced by mental health sufferers in accessing exercise (Paluska & Schwenk, 2000) called for a tailored physical activity intervention that is accessible to those with mental illness (Richardson, et al., 2005).

A Supportive Mental Health Community: So to overcome the barrier to participating in physical activity of stigma (Feldman & Crandall, 2007) and lack of social support (Daumit, et al., 2005, McDevitt, et al., 2006, Usher, et al., 2007) Rollin' with the Punches provided a supportive mental health community. Rollin' with the Punches was delivered by coaches with training in community mental health work who were fully aware of participants needs and able to understand them. All participants were mental illness sufferers, which created an understanding and empathetic community. The camaraderie that is inherent within a boxing gym setting, which comes from mutual respect as 'fighters', provided a sense of community and a source of social support (Hills & Walker, 2017). A community was set up via WhatsApp group which enables participants to communicate amongst each other and support each other outside of the classes and group sessions. This gave participants the opportunity to share resources get updates on volunteering opportunities and events in a safe space monitored by the coaches.

Building Intensity: So to overcome the barriers to participating in physical activity of low confidence (Trost, et al., 2002; Usher, et al., 2007) and fatigue (Usher, et al., 2007) Rollin' with the Punches coaches were very careful with regard to the intensity of the boxing for participants, monitoring participants on an individual basis and building the intensity of their training gradually.

Physical Activity Leaders: So to overcome the barrier to participating in physical activity of lack of motivation and fatigue (Usher, et al., 2007), Fight 4 Change coaches have extensive experience of working with the 'hardest to help' and most disadvantaged target groups. As a result, they have developed into enthusiastic, knowledgeable and supportive physical activity leaders able to instill confidence in participants' ability to recover their wellness, which is an essential task for a physical activity leader of mental health sufferers in particular (Richardson, et al., 2005). Their enthusiastic and supportive coaching will also help to overcome fatigue.

Goal Setting & Monitoring: So to further overcome the barrier to participating in physical activity of lack of motivation (Usher, et al., 2007) Rollin' with the Punches incorporated goal-setting sessions, recognising that goals are more readily achieved if written down. Rollin' with the Punches coaches will ensure goals are specific, measurable, achievable, relevant and time-bound (SMART), applying techniques used by sport psychologists with professional boxers so to maximise probability that participants will achieve their goals. Follow up sessions monitored participants progress against goals, in addition to attendance registers.

Boxing as an Analogy

“Let me tell you something you already know.
 The world ain’t all sunshine and rainbows.
 It’s a very mean and nasty place and I don’t care how tough you are, it will beat you to your knees and keep you there
 permanently if you let it.
 You, me, or nobody is gonna hit as hard as life.
 But it ain’t about how hard you hit.
 It’s about how hard you can get hit and keep moving forward.
 How much you can take and keep moving forward.
 That’s how winning is done!”

Rocky Balboa

An analogy is a comparison between things that have similar features in order to help explain a principle or idea. Rollin’ with the Punches designed boxing so that comparisons could be made to other contexts so to teach life skills and develop values. Specifically, a boxing game, drill or technique was designed to reflect a principle or idea associated with a life skill or value. Through the boxing-based game, drill or technique participants gained an understanding of the principle or idea as it relates to boxing. Following the game or drill, participants were asked to reflect on what they have experienced and to articulate the principle or idea. Once participants have understood the principle or idea within a boxing context, they are asked to reflect upon other contexts where that principle or idea would be important and useful to them. Where the drill or game was well designed, and the principle or idea was clear, participants were able to identify how the principle or idea could be applied in other contexts.

Boxing works effectively as an analogy because, if well designed, it is fun and meaningful. Without the use of boxing as an analogy, principles and messages can be highly abstract with limited associations that can be made in order to learn the principle or message. The use of boxing can take abstract concepts and apply these concepts using the rich content of boxing, so that deeper learning occurs. For example, as the above quote from the film Rocky Balboa illustrates, the challenges that the target group face in life can be framed as a fight (e.g. “You, me, or nobody is gonna hit as hard as life”) and participants can be framed as fighters who can be resilient to these challenges (e.g., It’s about how hard you can get hit and keep moving forward. How much you can take and keep moving forward).

The Rollin’ with the Punches curriculum covers a series of modules aimed to alleviate symptoms of mental illness and reduce the vulnerability of participants.

Examples of Curriculum Modules

Mental Toughness: Sufferers of mental illness are some of the most vulnerable people in society, which is confounded by misunderstandings by society, which result in stigma and discrimination (Rusch, et al., 2005). Furthermore, depression is associated with difficulties that inhibit the processing of negative material (Joorman & Gotlib, 2009) whilst anxiety involves feelings of unease, worry and fear as a response to feeling threatened (NHS, 2017).

To counter these symptoms, the ‘Mental Toughness’ module developed resilience in participants. This module incorporated drills where participants worked in pairs on a variety of foot, trunk and hand defences, in order to build up a repertoire of defences, so that they can handle whatever their opponent throws at them.

Following drills and games, participants reflected with their Rollin’ with the Punches coaches on how their skills make them more resilient and what techniques could be used to defend against stigma, discrimination and what they perceive as threats or negative material.

Controlling the Ring: Depression is a disorder of impaired emotion regulation associated with difficulties in cognitive control (Joorman & Gotlib, 2009). Furthermore, symptoms of anxiety are nervousness, feeling tense and 'on edge' (NHS, 2017).

To counter these symptoms, the 'Controlling the Ring' module trained participants how to control emotions, such as anger, within the ring and how to control nerves in the build up to a fight. Participants could talk with their coaches about different examples of when boxers' emotions had gotten the better of them and the negative outcomes that manifested. This was demonstrated by having participants train as if they were angry, throwing big punches, so that they could understand how this affects their performance, such as unnecessary burning of energy reserves due to loading up on all punches and loss of technique. Furthermore, participants were trained in sport psychology techniques, such as meditation, progressive muscle relaxation, breathing exercises, and emotional recovery techniques.

Following training in various techniques, participants reflected with their Rollin' with the Punches coaches on areas in their life where they could benefit from greater emotional control and how and when they could make use of the sport psychology techniques in their everyday lives.

Positive Mental Attitude: Both depression and anxiety are associated with negative thoughts, including hopelessness, despair, worthlessness and dwelling on negative experiences (NHS, 2017).

To counter these symptoms, the 'Positive Mental Attitude' module utilised several 'underdog' boxing stories, such as James Buster Douglas defeating Mike Tyson in 1990, Muhammad Ali defeating George Foreman in 1974, Max Schmeling defeating Joe Louis in 1936. Participants were encouraged to watch in their own time inspiring documentaries, such as 'When We Were Kings', to tell the stories and the positive mental attitudes that were part of these 'underdog' victories. These stories helped inspire participants to overcome their 'underdog' status and to focus on a positive mental attitude no matter how impossible the task may seem.

To develop a positive mental attitude, participants were trained in sport psychology techniques, such as visualisation and positive self-talk. Participants undertook drills where the odds were stacked against them, such as being blindfolded whilst trying to hit pads and placing restrictions on the boxers such as having one hand tied behind the back during drills. Placing participants in such situations allowed them to test the effect of their visualisation and positive self-talk techniques.

Following technique training and drills participants reflected with their Rollin' with the Punches coaches on situations where they felt negative and how they could make use of visualisation and positive self-talk to develop a more positive mental attitude in these situations.

Climbing Off the Canvas: Symptoms of depression and anxiety include feeling unable to cope and fearing the worst (NHS, 2017).

To counter these strategies, the 'Climbing Off the Canvas' module provided examples of boxers who had been knocked down in a fight only to climb off the canvas and ultimately win the fight, demonstrating that even when things don't go to plan and adversity occurs, it is still possible to achieve a desired outcome.

Participants worked with their Rollin' with the Punches coaches to develop pre-competition and competition strategies and routines, including strategies and routines for adverse situations, so that participants could develop coping strategies and routines to deal with adverse scenarios before they encounter them. Participants were subjected to adverse scenarios (starting from very mild adversity) in their boxing training, such as using bungee ropes to restrict movement, requiring participants to adapt and use other strategies.

Following practicing these techniques, participants reflected with their Rollin' with the Punches coaches on other adverse scenarios that they worry about in their everyday life and discussed strategies and routines that they could develop to counter these fears in advance of them happening.

Title-winning Goals: Symptom of depression include giving up on the will to live and an inability to make decisions (NHS, 2017). Furthermore, poor mental health limits opportunities to work, to live independently and to pursue other goals (Corrigan, 2005),

Goal-setting was used to remove barriers of a lack of motivation and drive in accessing physical activity. Furthermore, the 'Title-winning Goals' module was used to overcome the above symptoms of depression and limitations faced by the mentally ill. Rollin' with the Punches coaches engaged participants in SMART goal-setting sessions, initially specific to their boxing training. Participants were set performance plans just as they would be in a lead up to a fight, including goals such as sustaining a three-minute round of pad work, being able to complete a circuit of exercises within a specific time and losing weight.

Following boxing training goal-setting, participants reflected upon more general life goals and engaged in an additional goal-setting session focused on life goals. The Rollin' with the Punches programme manager also funded and referred participants to additional training and courses, such as Sports Activity Leaders Award (Level 1, Open College Network) and Business Start Up Courses, so as to contribute to the broader goals of participants and breaking down the barriers they may face in life.

Belief of a Champion: Mental health sufferers can accept the common prejudices about mental illness and turn against themselves, leading to a loss of self-esteem (Rusch, et al., 2005, NHS, 2017). Furthermore, symptoms of both depression and anxiety include feeling unable to cope, hopeless, worthless, focusing on negatives and fearing the worst (NHS, 2017).

To counter these symptoms, the 'Belief of a Champion' module used boxing drills with increasing level of challenge, such as the punching ratio drill to measure durability, punching speed and power. Participants were asked to exceed the number of hits in successive rounds. There were multiple challenges of this kind set within this module. As participants succeeded in a challenge, they progressed to the next level.

As participants progressed to the next level in a specific aspect of their training, they reflected with their Rollin' with the Punches coaches on how this made them feel. This reflection was extended to discuss other achievements and how they could make them feel, encouraging participants to focus on their achievements and how they felt in those moments, so as to build their confidence, esteem and efficacy.

In Your Corner: A symptom of depression is feeling isolated and unable to develop relationships (NHS, 2017). Furthermore, stigma limits the mentally ill from accessing treatment (Rusch, et al., 2005).

To counter these symptoms, the 'In Your Corner' module used boxing drills that focused on teamwork, seeking help and developing trust. For example, working in pairs, boxer A is blindfolded and shadow boxing in the ring, whilst boxer B gives out the instructions from outside the ring. There was more than one person in the ring so boxers needed to trust and listen to their partner to avoid other people in the ring.

After such drills, participants reflected with their Rollin' with the Punches coaches on how working as a team influenced their performance and how they felt in having to place their trust in someone else to determine their tactics. Participants were then asked to reflect on other scenarios and challenges in their life where they could benefit from team work and other sources of help that are available to them.

Switch Hitting: Anxiety can be helped by sufferers shifting their focus.

The 'Switch Hitting' module used drills where participants were required to switch hit (i.e., change between the orthodox and unorthodox boxing stances) and change the angles of their punches. For example, boxes around each punch bag will be numbered 1 to 4. When the whistle blows participants were required to move to the next box to throw a pre-determined combination in a different stance and using different angles of punches (e.g., straight, hooks and uppercuts), which became increasingly unorthodox.

After this drill, participants reflected with their Rollin' with the Punches coaches on what they were thinking when changes in combinations and stances occurred. Were they focused on their previous box or did the increased challenge require them to shift focus to their new box? On realisation that a new challenge requires a shift of focus, participants were asked to reflect on other situations where they might make a change or shift their focus in order to change a mind set.

Camp Conditioning: Stigma can result in mental health sufferers often turning to substance abuse (Corrigan, 2005).

To counter this problem, the 'Camp Conditioning' module taught participants the rules and approaches used by professional boxers to achieve optimum conditioning. Coaches provided talks and demonstrations around their own training and training cycles, which includes staying away from unhealthy foods, alcohol, drugs and smoking and replacing these toxins with nutritious eating habits.

Participants reflected on why conditioning and a healthy lifestyle is important for their boxing before reflecting upon why a healthy lifestyle is generally important.

Supplementary Programme Components

Warm up. This includes aerobics, general fitness, circuits, ropes and other exercises to warm up before the boxing. Goals are set each time and participants are able to keep track of their progress (goal setting). The session includes a range of drills such as partner drills - to aid in communication and connection, increase skill base and enable participants to try different ways of thinking and working. After the boxing, warm down exercises, which include stretches take place and then the session ends.

Counselling. In this session, a counsellor would be on-site to talk with participants to help them cope or overcome their mental health issues. This used to take place on Saturdays between 1 to 3 pm however it has stopped now. The Counsellor would have a one-to-one session with interested participants. Even though these sessions no longer hold, participants are made aware that the services of the Counsellor are available to them as needed.

Discussion groups and community. These discussions include identifying volunteering opportunities for participants and courses that would better their transferrable/life skills and aid transition back into society and the workplace. These include courses on health and safety, first aid, CCTV training, memoir writing and acting courses among others. When the participant indicates an area of interest, the participant and programme manager find the course, which Fight4Change funds. The programme manager also does a one-on-one follow-up with the participant to monitor participation in the course. A WhatsApp group was set up to allow participants to communicate amongst each other and have additional discussions outside of the sessions. This became a support network where participants would share information, check on and encourage each other.

Schedule

The duration of each Rollin' with the Punches session is 1.5 hours for boxing sessions and discussion groups which takes place thereafter. And they take place 3 days a week as seen below:

- Tuesdays: 12 noon to 1 pm.
- Thursdays: 2 pm to 3 pm.
- Saturdays: 1 pm to 2 pm.

Recruitment

Marketing. Flyers with all the sessions on it would be sent out internally to the referral agencies and so limited the participants to only referrals. This was done like this initially because F4C wanted dedicated participants. In addition, the age range was initially 16 and above. However, there were few participants from referrals and of these, it was seen that most of them were above 25. Therefore, the age range was changed to 25 and above and physical fliers were distributed through outreach teams of Fight 4 Change who shared it on the streets, in the community and with other organisations.

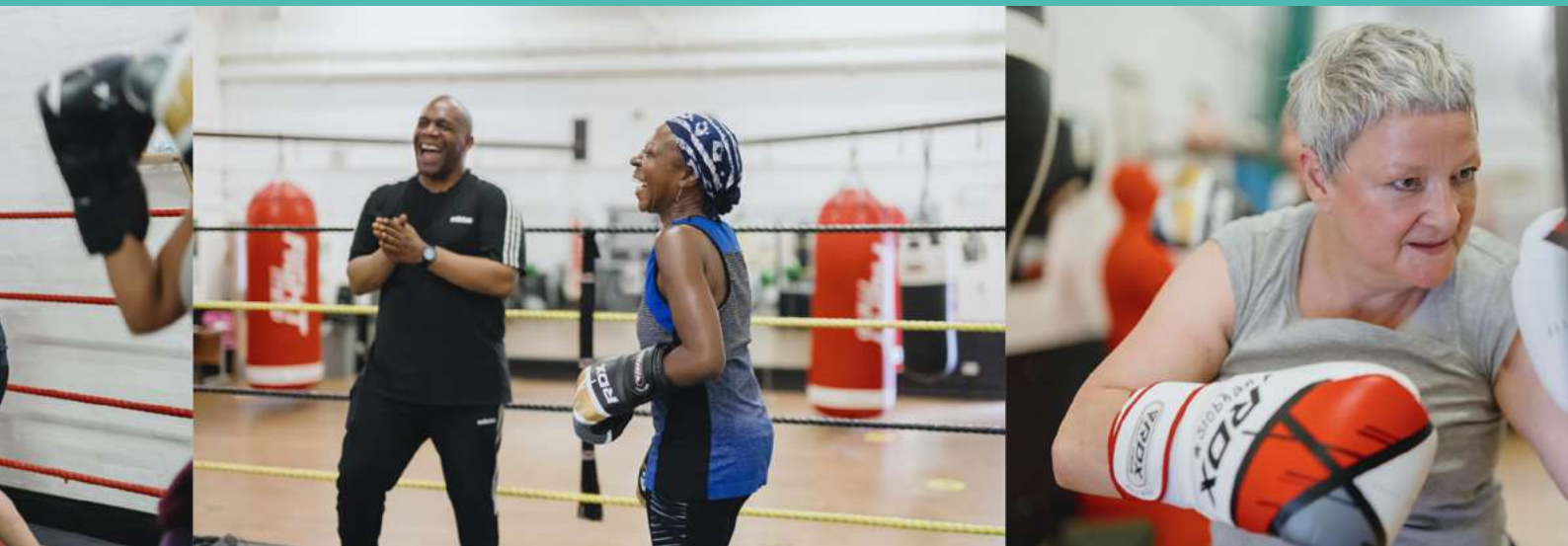
Referrals. A case worker from the referring agency would fill out the forms for the prospective participant. The referral form would then be sent to the RWP program manager who would then phone the participant to tell them about the sessions and encourage them to attend. If they didn't show up after a week, he would call back to follow up.

Research Questions

1. What is the effect of Rollin' with the Punches on relationships, self-belief, mental health and wellbeing and physical activity and health outcomes?
2. How does Rollin' with the Punches affect relationships, self-belief, mental health and wellbeing and physical activity and health outcomes?

RESEARCH PROCESS

05



Research Process

Mixed Methods

Rollin' with the Punches was evaluated using a mixed-methods approach, which entails “collecting and analyzing quantitative and then qualitative data in two consecutive phases within one study” (Ivankova, et al., 2006, p. 3). The mixed methods design uses quantitative methods to measure the effect of Rollin' with the Punches and qualitative research to capture the mechanisms, processes, and experiences on the Rollin' with the Punches programme, so to explain the effects, or lack of effects, found (Creswell, et al., 2003).

Combining both quantitative and qualitative data enabled the research team to take advantage of the relative and complementary strengths of each data type to answer the posited research questions, a guiding principle of mixed-method research (Johnson & Turner, 2003). The use of a time efficient quantitative questionnaire achieved breadth; a sufficient number of responses was achieved so that the results from our sample could be extrapolated to the population of all Rollin' with the Punches participants (Firestone, 1993), whereas the use of semi-structured interview collecting qualitative data achieved depth; capturing the complexity of the factors behind effects (Creswell, 2012). The collection of uniform data via the questionnaire allows for measurement of the effects of participating in Rollin' with the Punches and the counterfactual of not participating in the pursuit of internal validity and causal inference (Burtless, 1995), whereas the use of flexible semi-structured interviews within the natural setting of the intervention allows for probing of factors to understand mechanisms behind effects (or lack of) and external validity. Finally, the use of quantitative data aims to objectively measure effect, whereas the use of qualitative data aims to subjectively interpret the meanings that participants brought to the intervention (Denzin & Lincoln, 2011).

In sum, the use of mixed methods provides “a plurality of interests, voices, and perspectives” (Greene & Caracelli, 1997, p. 14) to measure and understand effect. Quantitative data in isolation does not answer how or why a treatment variable works (Deaton, 2010), leading to a black box view of causality (Imai, et al., 2011).

Quantitative Technique

To measure the effect of Rollin' with the Punches a quasi-experiment survey design was adopted, whereby data was collected by a digital questionnaire from Rollin' with the Punches participants and a control group (i.e., equivalent individuals who did not participate in the programme). Rollin' with the Punches is an ongoing intervention of no fixed duration, so this design made use of only post-programme questionnaires (as opposed to pre- and post-questionnaires) measuring the outcomes described below. Data collection was undertaken during Summer 2022, which included asking all current and former participants to complete the online questionnaire. As well as emailing participants the link to the online questionnaire, the research team also attended sessions with tablets to complete the questionnaire with participants. Concurrently, so to construct a control group, the online questionnaire was emailed to mental health support groups and charities, who distributed the online questionnaire via their channels.

Relationships variables

Quality of personal relationships was measured using the personal relationships sub-scale of the World Health Organization's (1998) quality of life assessment (3 items, $\alpha = 0.815$).

Sense of community, defined as the feeling that members have of belonging, the feeling that the members matter to one another and to the group, and a shared faith that their needs will be met through their commitment to be together (McMillan & Chavis, 1986) was measured using Peterson et al.'s (2008) sense of community scale (6 items, $\alpha = 0.963$).

Self-belief variables

Mental health self-mastery, defined as the ability to take control of one's own mental health without being blown off course, was measured using Marshall and Lang's (1990) self-mastery scale, adapted to incorporate mental health (5 items, $\alpha = 0.861$).

Self-esteem, which is defined as one's positive or negative attitude toward oneself and one's evaluation of one's own thoughts and feelings overall in relation to oneself (Rosenberg, 1965), was measured using Rosenberg's (1965) self-esteem scale, which was shortened to the most relevant items (5 items, $\alpha = 0.61$).

Self-efficacy, defined as the belief in one's competence to tackle difficult or novel tasks (Luszczynska, et al., 2005) was measured using Jerusalem and Schwarzer's (1995) generalized self-efficacy scale (3 items, $\alpha = 0.862$).

Health and wellbeing variables

Health satisfaction and life satisfaction were both measured using single items from the World Health Organization's (1998) quality of life assessment.

Mental health, defined in terms of mood and ability to think, satisfaction with social activities and relationships and emotional problems, was measured using Hays et al.'s (2017) PROMIS global mental health scale (3 items, $\alpha = 0.78$).

Mental well-being was measured using Stewart-Brown et al.'s (2009) shortened version of the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS), which was further shortened to the most relevant items (4 items, $\alpha = 0.888$).

Coping self-efficacy, defined as one's confidence in performing coping behaviors when faced with life challenges, was measured using Chesney et al.'s (2006) coping self-efficacy scale, which was shortened to the most relevant items (3 items, $\alpha = 0.898$).

Stress was measured using Cohen et al.'s (1983) perceived stress scale, which was shortened to the most relevant items (4 items, $\alpha = 0.806$).

Anxiety was measured using Chlan et al.'s (2003) shortened version of the Spielberger State-Trait Anxiety Inventory (STAI), which was further shortened to the most relevant items (4 items, $\alpha = 0.845$).

Physical activity and health variables

Physical activity was measured via Sport England's Single Item Measure (SIM), which measured days in the past week that a respondent had undertaken at least 30 minutes of physical activity that was sufficient to raise their breathing rate.

Perceived physical health, defined in terms of ability to carry out everyday physical activities, average rating of pain over the past week and average rating of tiredness, was measured using Hays et al.'s (2017) PROMIS Global Physical Health scale (3 items, $\alpha = 0.713$).

Data Analysis

Means and standard deviations were calculated for each outcome variable for the experimental and control conditions and compared using independent sample t-tests. However, so to limit the selection bias caused by non-random assignment to conditions, propensity score matching was undertaken whereby control cases were matched against treatment cases on the basis of covariates that could be potentially confounding (i.e., alternative explanations for differences between conditions on the outcome variables):

- Ethnicity
- Gender
- Age
- Religion
- Sexuality
- Deprivation decile
- Chronic illness status
- Debilitating chronic illness status
- Highest level of education
- Employment status
- Having anxiety
- Having depression
- Having post-traumatic stress disorder (PTSD)
- Having phobias
- Having obsessive-compulsive disorder (OCD)
- Having panic disorder/panic attacks
- Having antisocial personality disorder (ASPD)
- Having borderline personality disorder (BPD)
- Having bipolar disorder
- Having schizophrenia
- Having an other mental health problem

On the basis of these covariates, the propensity of control cases being selected into the treatment condition were calculated and used to match to treatment cases. Given that the control group was smaller than the experimental group a with replacement approach to matching was undertaken whereby control cases could be matched against treatment cases on multiple occasions. Different tolerance levels for the amount that matched cases' propensity scores could differ by were explored and a caliper of 0.02 was identified as the strictest tolerance level against which the majority of treatment cases achieved a match: 48 out of 69 treatment cases were matched against control cases.

Adequacy of the matching was tested using paired samples t-tests for scale data covariates, McNemar's tests for dichotomous categorical data covariates and tests of marginal homogeneity for categorical data covariates. Conditions did not significantly differ by ethnicity (MH = 79, $p = 0.172$), gender ($p = 1.0$), age ($t(47) = 0.855$, $p = 0.397$), religion (MH = 148, $p = 0.362$), sexuality (MH = 29, $p = 0.399$), chronic illness ($p = 0.424$), debilitating chronic illness ($p = 0.678$), highest education level (MH = 153, $p = 0.724$), employment status (MH = 157, $p = 0.25$), deprivation decile ($t(47) = -0.657$, $p = 0.512$), anxiety ($p = 0.648$), depression ($p = 0.664$), PTSD ($p = 0.629$), phobias ($p = 0.18$), OCD ($p = 0.302$), panic ($p = 1.0$), ASPD ($p = 0.146$), BPD ($p = 0.18$), bipolar disorder ($p = 0.687$), schizophrenia ($p = 0.581$) and other illness ($p = 0.238$).

Once cases had been matched, means and standard deviations were again calculated for each outcome variable and paired samples t-tests ran, using a one-sided p value, to test for statistical significance in any differences. Effect sizes were calculated for the significant results to determine the level of practical significance. According to Cohen (1992), $d = 0.2$ is a small effect, $d = 0.5$ is a moderate effect, and $d = 0.8$ is a large effect

Qualitative Technique

In order to understand the processes and mechanisms of the Rollin' with the Punches intervention and the experiences of participants, an interpretive approach was used to capture meanings (Denzin & Lincoln, 2011) and qualitative data was used to capture rich and nuanced accounts (Creswell, 2012).

Data Collection

Observation was used to get close to and directly capture accurate meanings and experiences (Becker, 1996). Pure, as opposed to participant, observation, with physical and cognitive separation, was used so that behaviour and interaction continued uninterrupted by intrusion, thus achieving greater objectivity (Adler & Adler, 1994). Researchers visited Rollin' with the Punches sessions taking place at the Black Prince Community Trust in Lambeth on ten occasions throughout the duration of the programme and took field notes that captured observations, discussions, interpretations and reflections.

Semi-structured interviews were used to capture participants' and deliverers' interpretations of programme processes and mechanisms and their experiences of the programme. Semi-structures interviews are the most effective method to capture experiences because they allow for explanation of answers and illustrative examples (Rubin & Rubin, 2005). In total, twelve interviews were undertaken with participants, six of whom were white, three Black/Black British and three mixed. Eight of the participants were females and four males. Ages range from 22 to 58 years old. Questions sought to understand how participants were recruited to the programme, participants' mental health background, their experience on the programme, their experience of the use of boxing on the programme and their perceived changes. Furthermore, three interviews were undertaken with Rollin' with the Punches programme administrators. Questions sought to understand the recruitment and marketing used, programme delivery, perceived impact and its sustainability, and challenges and lessons learned.

Data Analysis

A thematic analysis process was undertaken, which involved identifying, analyzing and reporting patterns within the data (Braun & Clarke 2006). Data consisted of observation field notes and interview transcripts, which were analysed using an inductive coding strategy, rather than using pre-defined codes, to extract themes and quotes related to processes, mechanisms and experiences, using a line-by-line open coding procedure to "expose the thoughts, ideas, and meanings contained therein" (Strauss & Corbin, 1998, p. 102). Segments of relevant and meaningful text were identified and initial codes were attributed (Spiggle, 1994). Axial coding was then used to group these segments of text into larger abstract categories, to sort, synthesize, organize, and reassemble the data (Creswell & Miller, 2000). Validity of the qualitative data was ensured through: (1) the use of multiple methods of data collection (observations, interviews and focus groups), and (2) through the use of multiple researchers to reduce researcher bias (Maxwell, 2012).

PARTICIPANT DEMOGRAPHICS

06

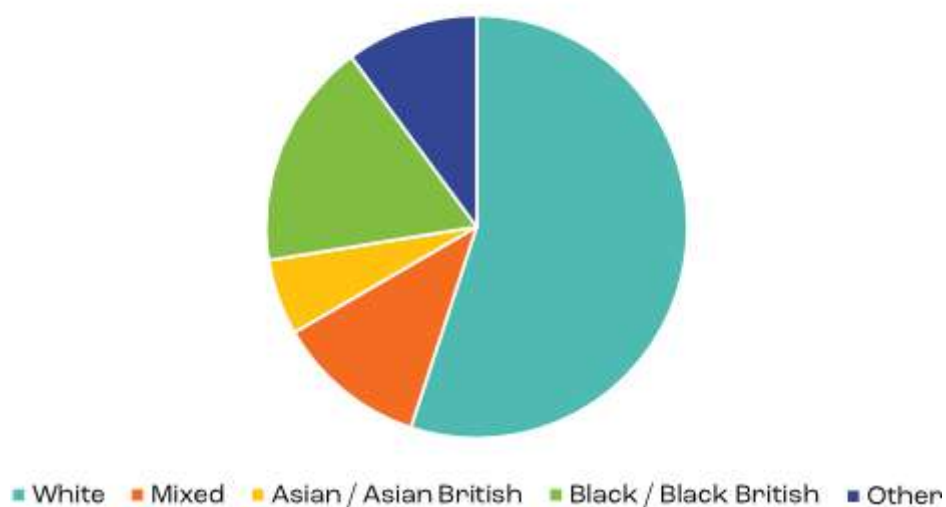


Participant Demographics

Ethnicity

Category	RWP Participants		Control Group		Total	
	Total	%	Total	%	Total	%
White	38	55%	27	66%	65	59%
Mixed	8	12%	4	10%	12	11%
Asian / Asian British	4	6%	2	5%	6	6%
Black / Black British	12	17%	7	17%	19	17%
Other	7	10%	1	2%	8	7%
Total	69	100%	41	100%	110	100%

RWP Participants Ethnicity

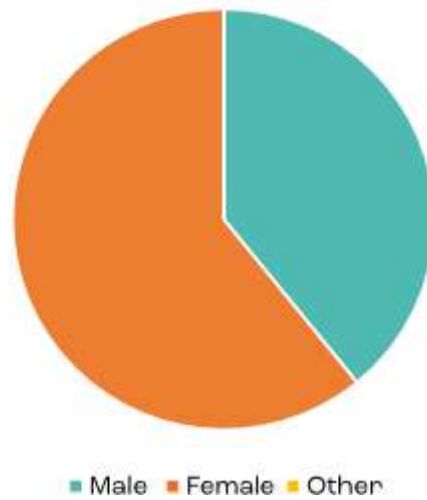


The majority of Rollin' with the Punches participants were White (55%) and more so in the control group (66%).

Gender

Category	RWP Participants		Control Group		Total	
	Total	%	Total	%	Total	%
Male	27	39%	16	39%	43	39%
Female	42	61%	24	59%	66	60%
Other	0	0%	1	2%	1	1%
Total	69	100%	41	100%	110	100%

RWP Participants Gender

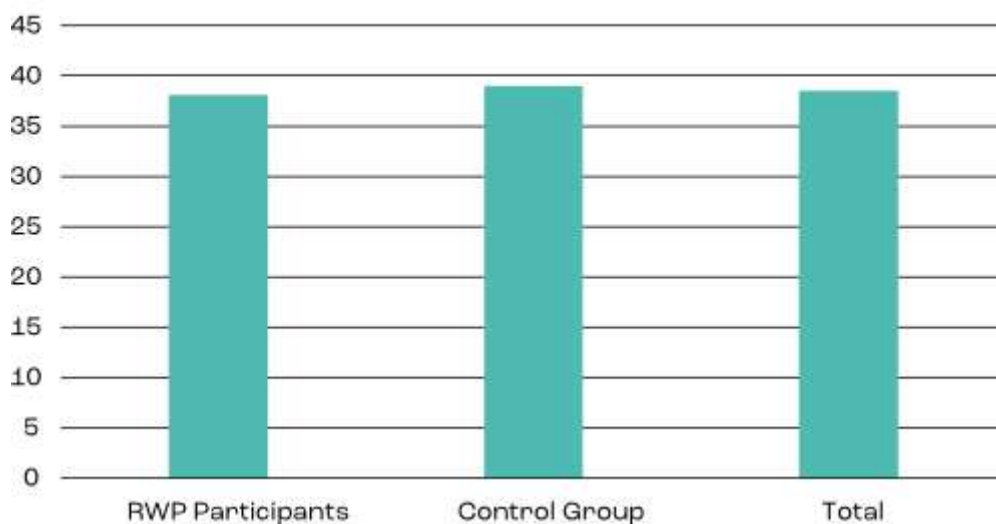


The majority of Rollin' with the Punches participants were female (61%) as were the control group (60%).

Age

	RWP Participants	Control Group	Mean Difference
Mean	38.1	39	38.5
SD	12.0	12.9	12.3
Min	18	18	18
Max	58	58	58

Mean Age

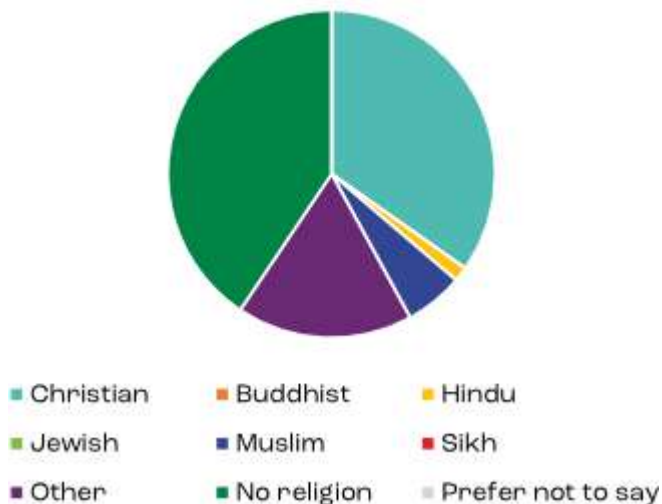


Rollin' with the Punches participants were, on average, 38.1 years old, marginally younger than the average age of the control group (39 years old).

Religion

Category	RWP Participants		Control Group		Total	
	Total	%	Total	%	Total	%
Christian	24	35%	16	39%	40	36%
Buddhist	0	0%	1	2%	1	1%
Hindu	1	1%	0	0%	1	1%
Jewish	0	0%	0	0%	0	0%
Muslim	4	6%	3	7%	7	6%
Sikh	0	0%	1	2%	1	1%
Other	12	17%	1	2%	13	12%
No Religion	28	41%	19	46%	47	43%
Prefer not to say	0	0%	0	0%	0	0%
Total	69	100%	41	100%	110	100%

RWP Participants Religion

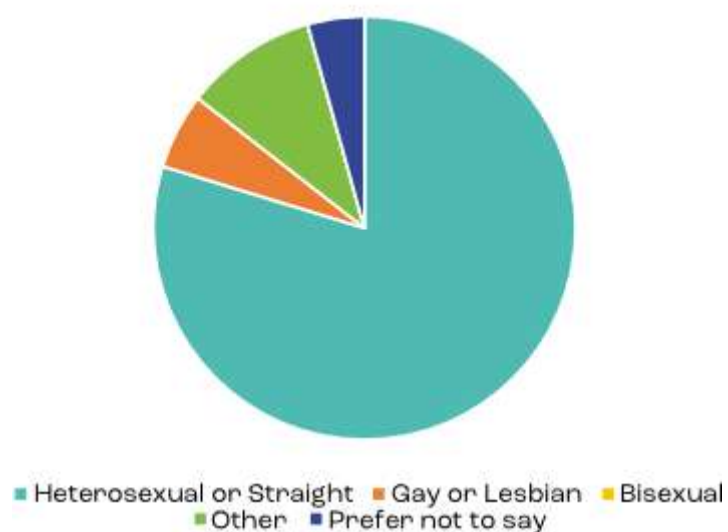


The most common religion of Rollin' with the Punches participants was Christianity (35%), although more participants had no religion (41%). This was mirrored in the control group (39% Christian; 43% no religion).

Sexuality

Category	RWP Participants		Control Group		Total	
	Total	%	Total	%	Total	%
Heterosexual or Straight	55	80%	30	73%	85	77%
Gay or Lesbian	4	6%	0	0%	4	4%
Bisexual	7	10%	3	7%	10	9%
Other	0	0%	4	10%	4	4%
Prefer not to say	3	4%	4	10%	7	6%
Total	69	100%	41	100%	110	100%

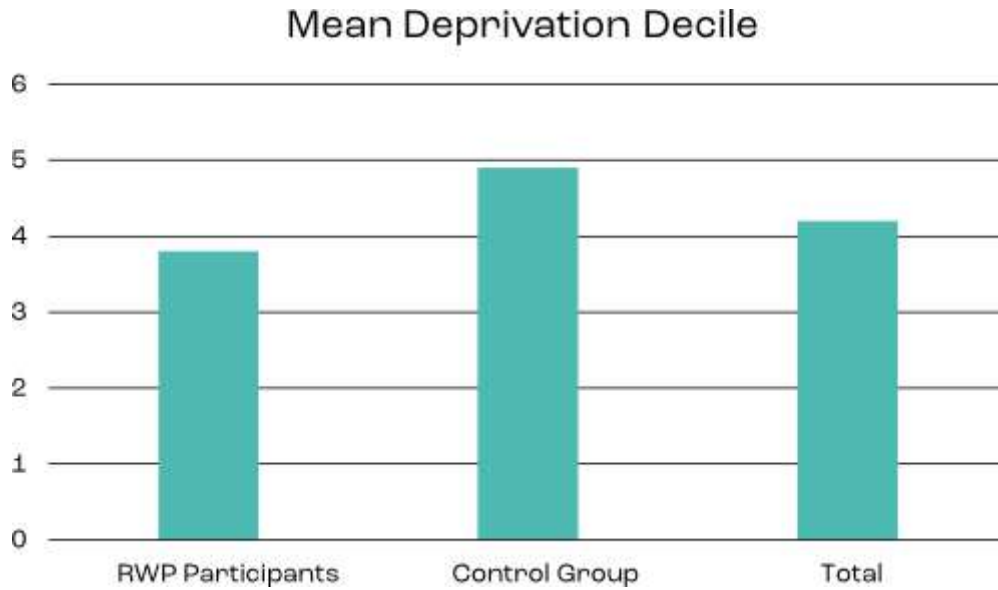
RWP Participants Sexuality



The majority of Rollin' with the Punches participants were heterosexual or straight (80%), which was consistent with the control group (77%).

Deprivation

	RWP Participants	Control Group	Mean Difference
Mean	3.8	4.9	4.2
SD	1.8	2.6	2.2
Min	2	1	1
Max	9	10	10

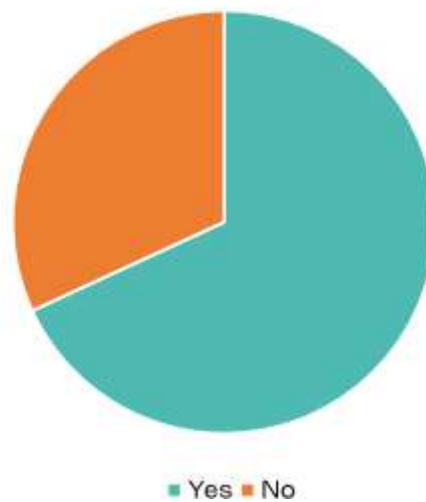


Participants from the control group were, on average, very close to the median level of deprivation in terms of deciles (4.9), whereas Rollin' with the Punches participants were more deprived (3.8 on a scale of 1-10, whereby 1 = most deprived).

Chronic Illness

Category	RWP Participants		Control Group		Total	
	Total	%	Total	%	Total	%
Yes	47	68%	27	66%	74	67%
No	22	32%	14	34%	36	33%
Total	69	100%	41	100%	110	100%

RWP Participants Chronic Illness

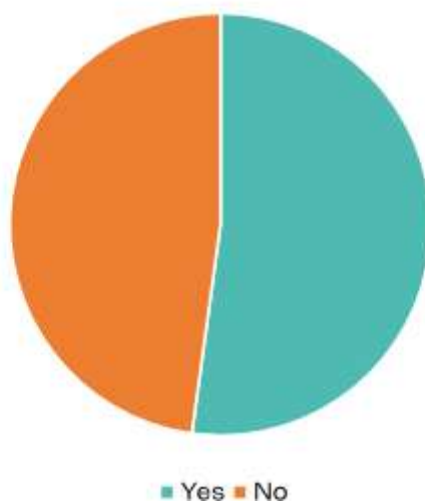


The majority of Rollin' with the Punches participants suffered from a chronic illness (68%), which was consistent with the control group (66%).

Debilitating Chronic Illness

Category	RWP Participants		Control Group		Total	
	Total	%	Total	%	Total	%
Yes	36	52%	23	56%	59	54%
No	33	48%	18	44%	51	46%
Total	69	100%	41	100%	110	100%

RWP Participants Debilitating Chronic Illness



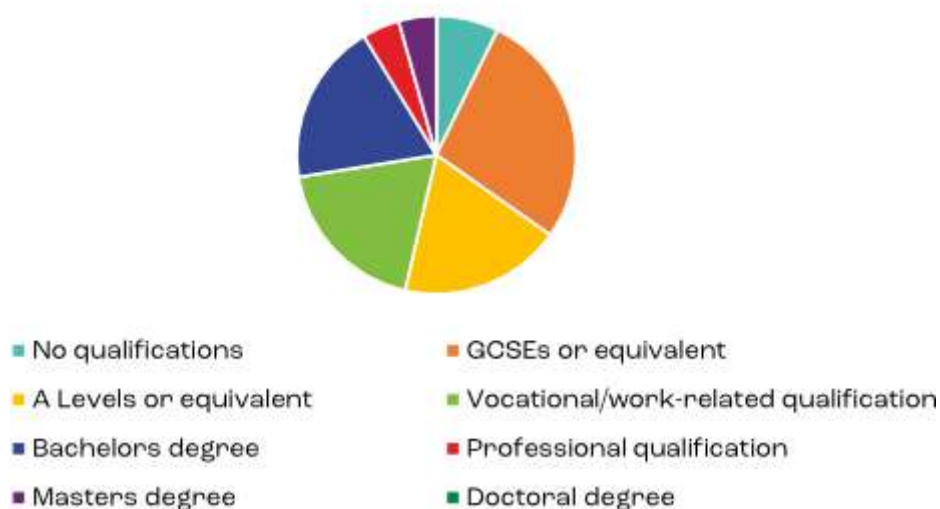
The majority of Rollin' with the Punches participants suffered from a debilitating chronic illness (52%), which was consistent with the control group (56%).

Highest Level of Education

Category	RWP Participants		Control Group		Total	
	Total	%	Total	%	Total	%
No qualifications	5	7%	1	66%	6	6%
GCSEs or equivalent	19	28%	8	20%	27	25%
A Levels or equivalent	13	19%	6	15%	19	17%
Vocational/work-related qualification	13	19%	6	15%	19	17%
Bachelors degree	13	19%	7	17%	20	18%

Professional qualification	3	4%	7	17%	10	9%
Masters degree	3	3%	5	12%	8	7%
Doctoral degree	0	0%	1	2%	1	1%
Total	69	100%	41	100%	110	100%

RWP Participants Highest Level of Education



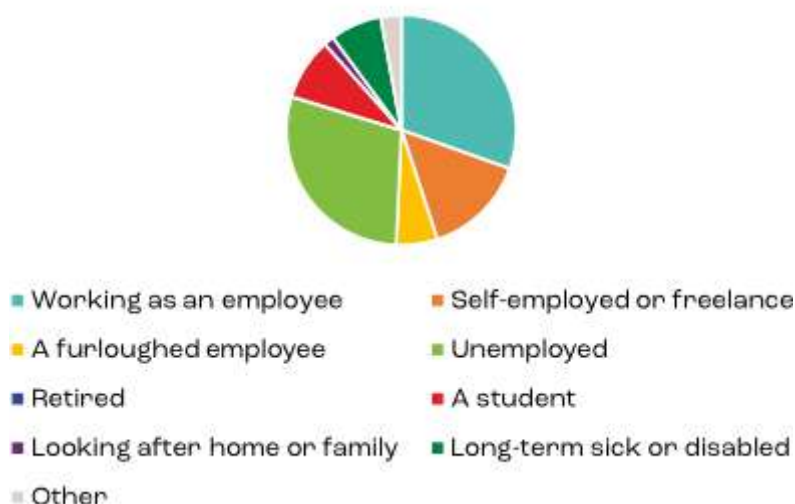
The most common highest level of education of Rollin' with the Punches participants was GCSEs or equivalent (28%), which was consistent with the control group, although less (20%).

Employment Status

Category	RWP Participants		Control Group		Total	
	Total	%	Total	%	Total	%
Working as an employee	21	30%	16	39%	37	34%
Self-employed or freelance	10	15%	9	22%	19	17%
A furloughed employee	4	6%	1	2%	5	5%
Unemployed	20	29%	4	10%	24	22%
Retired	0	0%	1	2%	1	1%
A student	6	9%	3	7%	9	8%
Looking after home or family	1	1%	2	5%	3	3%

Long-term sick or disabled	5	7%	5	12%	10	9%
Other	2	3%	0	0%	2	2%
Total	69	100%	41	100%	110	100%

RWP Participants Employment Status



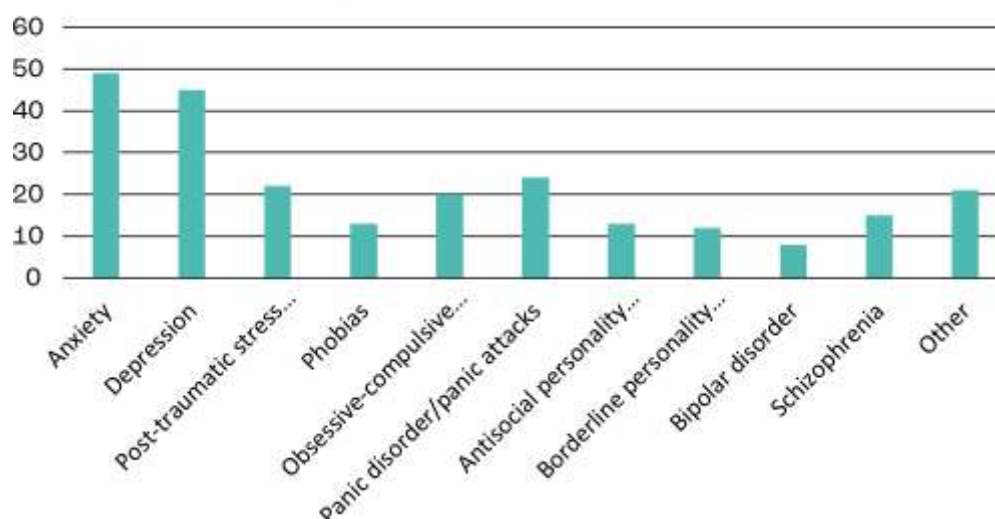
The most common employment status of Rollin' with the Punches participants was working as an employee (30%) closely followed by unemployed (29%). Working as an employee was also the most common employment status of control group participants (39%), but far less were unemployed (10%).

Mental Health Problems

Category	RWP Participants		Control Group		Total	
	Total	%	Total	%	Total	%
Anxiety	49	71%	32	78%	81	74%
Depression	45	65%	23	56%	68	62%
Post-traumatic stress disorder (PTSD)	22	32%	14	34%	36	33%
Phobias	13	19%	8	20%	21	19%
Obsessive-compulsive disorder (OCD)	20	29%	9	22%	29	26%
Panic disorder/panic attacks	24	35%	19	46%	43	39%

Antisocial personality disorder (ASPD)	13	19%	7	17%	20	18%
Borderline personality disorder (BPD)	12	17%	4	10%	16	15%
Bipolar disorder	8	12%	6	15%	14	13%
Schizophrenia	15	22%	5	12%	20	18%
Other	21	30%	5	12%	26	24%

RWP Participants Mental Health Problems

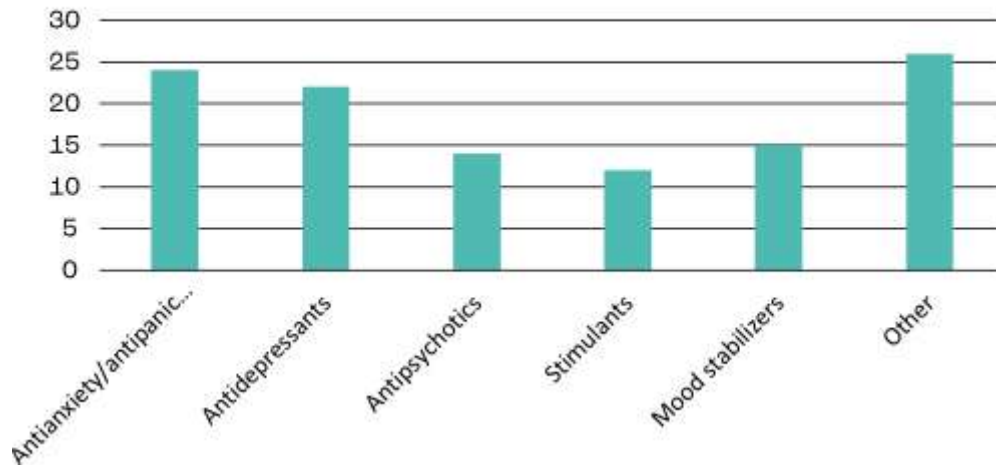


The majority of Rollin' with the Punches participants suffered from anxiety (71%) and depression (65%), which was mirrored in the control group (anxiety 78%; depression 56%), followed by panic disorder or panic attacks (Rollin' with the Punches participants 35%; control group participants 46%).

Mental Health Problems

Category	RWP Participants		Control Group		Total	
	Total	%	Total	%	Total	%
Antianxiety/antipanic medications	24	35%	14	34%	38	35%
Antidepressants	22	32%	21	51%	43	39%
Antipsychotics	14	20%	5	12%	19	17%
Stimulants	12	17%	7	17%	19	17%
Mood stabilizers	15	22%	8	20%	23	21%
Other	26	38%	7	17%	33	30%

RWP Participants Medication for Mental Health Problems



Approximately a third of Rollin' with the Punches participants took antianxiety/antipanic medications (35%), antidepressants (32%) or other medications (38%). In the control group over half of participants took antidepressants (51%) and over a third antianxiety/antipanic medications (34%).

In summary, the experimental and control groups are broadly similar, although the non-random convenience sampling has resulted in some socioeconomic differences (deprivation decile, employment status) and in medications taken. As such, stronger causal inference can be achieved by matching participants in the experimental and control groups using the demographic variables measured.

RELATIONSHIP FINDINGS

07

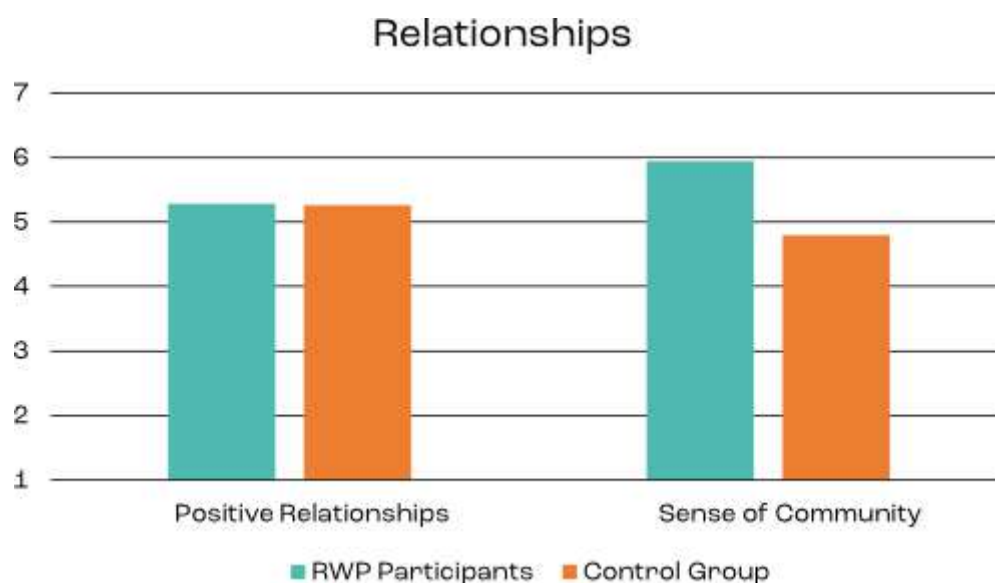


Relationship Findings

Unmatched Analysis

	RWP Participants		Control Group		Mean Difference
	Mean	SD	Mean	SD	Mean
N	69		41		
Positive Relationships	5.28	1.28	5.26	1.39	+0.02
Sense of Community	5.95	0.98	4.8	1.52	+1.14*

*Statistically significant difference, $p < 0.001$



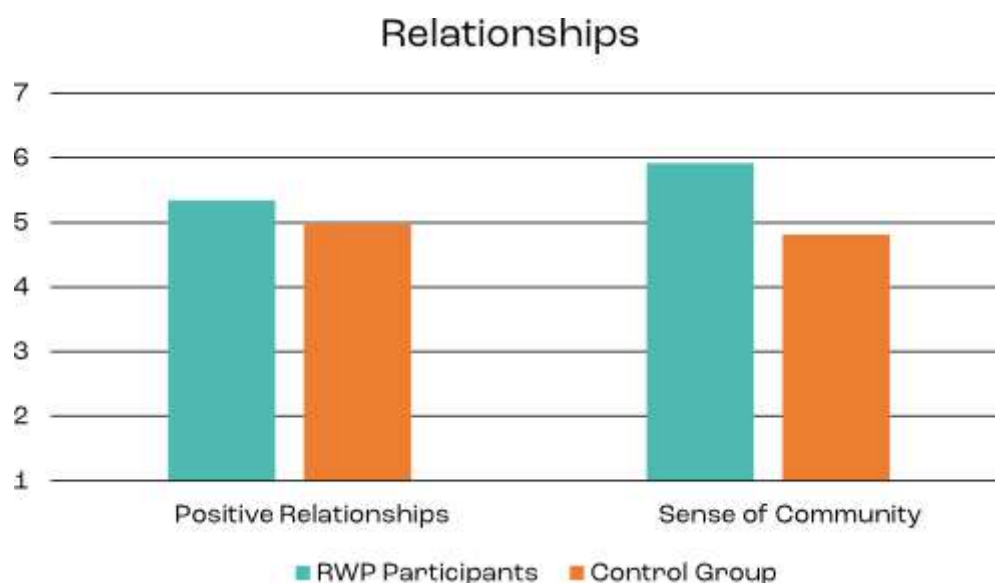
There was no significant difference in sense of positive relationships between the experimental group (5.28 ± 1.28) and the control group (5.26 ± 1.39), a mean difference of 0.02 (95% CI, -0.495 to 0.535), $t(108) = 0.077$, $p = 0.469$.

Sense of community was significantly higher in the experimental group (5.95 ± 0.98) compared to the control group (4.8 ± 1.52), a mean difference of 1.14 (95% CI, 0.613 to 1.673), $t(58.84) = 4.314$, $p < 0.001$, a large effect ($d = 0.95$, 95% CI, 0.539 to 1.352).

Matched Analysis

	RWP Participants		Control Group		Mean Difference
N	69		41		
	Mean	SD	Mean	SD	Mean
Positive Relationships	5.34	1.17	4.97	1.22	+0.37
Sense of Community	5.92	0.98	4.81	1.11	+1.11*

*Statistically significant effect, $p < 0.01$



There was no significant difference in sense of positive relationships between the experimental group (5.34 ± 1.17) and the control group (4.97 ± 1.22), a mean difference of 0.37 (95% CI, -0.134 to 0.87), $t(47) = 1.474$, $p = 0.074$.

Sense of community was significantly higher in the experimental group (5.92 ± 0.98) compared to the control group (4.81 ± 1.11), a mean difference of 1.11 (95% CI, 0.67 to 1.559), $t(47) = 5.041$, $p < 0.001$, a medium to large effect (Cohen's $d = 0.73$).

SELF-BELIEF FINDINGS

08

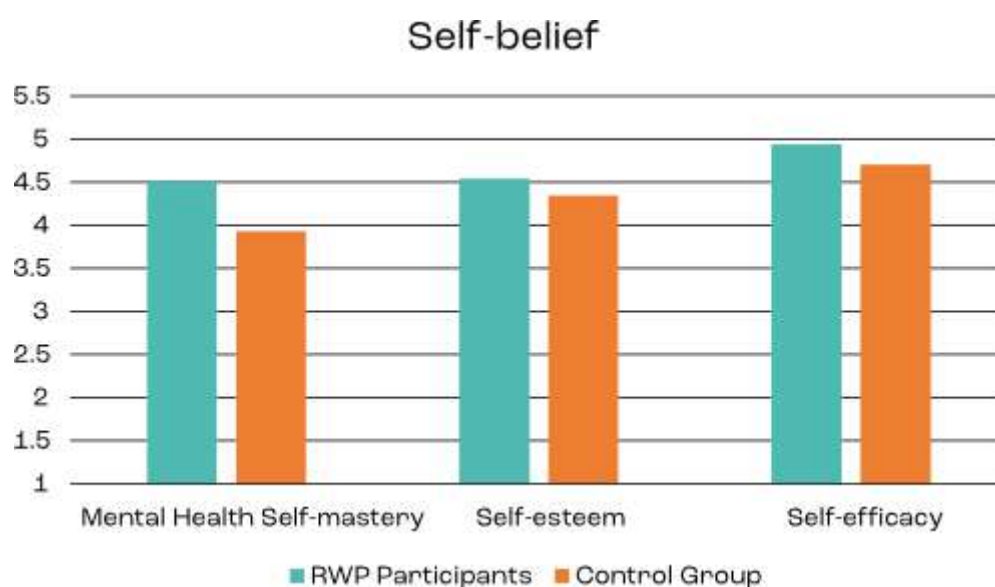


Self-belief Findings

Unmatched Analysis

	RWP Participants		Control Group		Mean
N	69		41		
	Mean	SD	Mean	SD	Mean
Mental Health Self-mastery	4.51	1.45	3.93	1.48	+0.58*
Self-esteem	4.54	0.93	4.35	1.19	+0.19
Self-efficacy	4.94	1.33	4.7	1.51	+0.24

*Statistically significant difference, $p < 0.05$



Mental health self-mastery was significantly higher in the experimental group (4.51 ± 1.45) compared to the control group (3.93 ± 1.48), a mean difference of 0.58 (95% CI, 0.007 to 1.15), $t(108) = 2.01$, $p = 0.023$, a small to medium effect ($d = 0.4$, 95% CI, 0.005 to 0.785).

There was no significant difference in self-esteem between the experimental group (4.54 ± 0.93) and the control group (4.35 ± 1.19), a mean difference of 0.19 (95% CI, -0.219 to 0.589), $t(108) = 0.909$, $p = 0.183$.

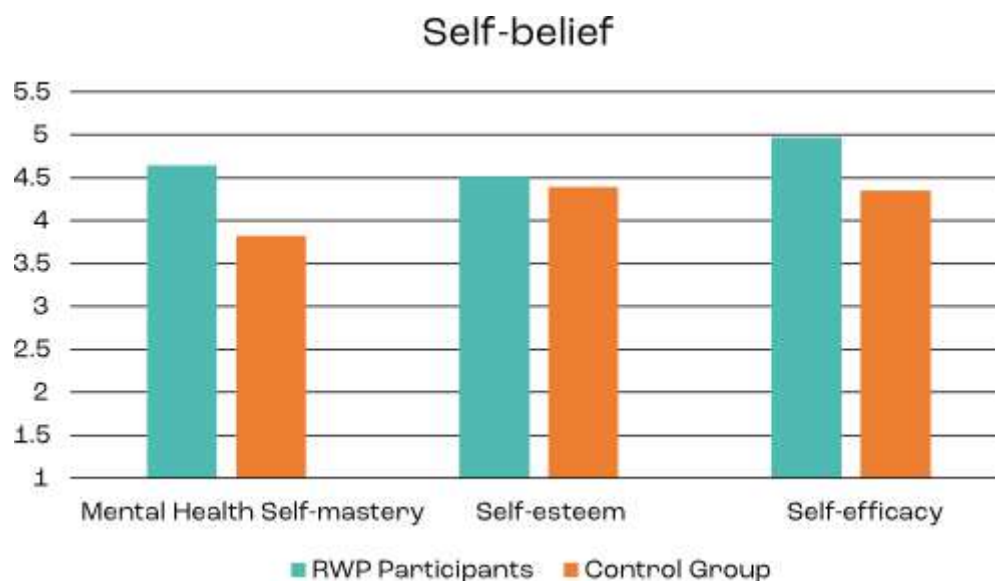
There was no significant difference in self-efficacy between the experimental group (4.94 ± 1.33) and the control group (4.7 ± 1.51), a mean difference of 0.24 (95% CI, -0.308 to 0.784), $t(108) = 0.864$, $p = 0.195$.

Matched Analysis

	RWP Participants		Control Group		Mean
N	69		41		
	Mean	SD	Mean	SD	Mean
Mental Health Self-mastery	4.64	1.36	3.82	0.94	+0.83*
Self-esteem	4.51	0.86	4.39	0.99	+0.12
Self-efficacy	4.97	1.21	4.35	1.06	+0.61**

*Statistically significant effect, $p < 0.001$

**Statistically significant effect, $p < 0.01$



Mental health self-mastery was significantly higher in the experimental group (4.64 ± 1.36) compared to the control group (3.82 ± 0.94), a mean difference of 0.83 (95% CI, 0.318 to 1.332), $t(47) = 3.276$, $p < 0.001$, a medium effect ($d = 0.4$, 95% CI, 0.172 to 0.769).

There was no significant difference in self-esteem between the experimental group (4.51 ± 0.93) and the control group (4.35 ± 1.19), a mean difference of 0.12 (95% CI, -0.291 to 0.524), $t(47) = 0.576$, $p = 0.284$.

Self-efficacy was significantly higher in the experimental group (4.97 ± 1.21) compared to the control group (4.35 ± 1.06), a mean difference of 0.62 (95% CI, 0.146 to 1.091), $t(47) = 2.632$, $p = 0.006$, a small to medium effect ($d = 0.38$, 95% CI, 0.085 to 0.671). This effect was not evident when covariates were not controlled for.

MENTAL HEALTH & WELLBEING FINDINGS

09



Mental Health & Wellbeing Findings

Unmatched Analysis

	RWP Participants		Control Group		Mean
N	69		41		
	Mean	SD	Mean	SD	Mean
Health Satisfaction	5.09	1.36	4.59	1.64	+0.5*
Life Satisfaction	4.77	1.48	4.88	1.6	-0.11
Mental Health	4.58	1.1	4.28	1.47	+0.3
Mental Wellbeing	5.11	1.2	4.46	1.56	+0.64*
Coping Self-efficacy	4.8	1.19	3.99	1.56	+0.81**
Stress	4.11	1.28	4.36	1.46	-0.25
Anxiety	3.61	1.42	4.35	1.5	-0.74*

*Statistically significant difference, $p < 0.05$

**Statistically significant difference, $p = 0.01$



Health satisfaction was significantly higher in the experimental group (5.09 ± 1.36) compared to the control group (4.59 ± 1.64), a mean difference of 0.5 (95% CI, -0.073 to 1.076), $t(108) = 1.73$, $p = 0.043$, a small to medium effect ($d = 0.4$, 95% CI, 0.005 to 0.785).

There was no significant difference in life satisfaction between the experimental group (4.77 ± 1.48) and the control group (4.88 ± 1.6), a mean difference of -0.11 (95% CI, -0.701 to 0.481), $t(108) = -0.369$, $p = 0.356$.

There was no significant difference in mental health between the experimental group (4.54 ± 0.93) and the control group (4.35 ± 1.19), a mean difference of 0.3 (95% CI, -0.235 to 0.825), $t(66.826) = 1.112$, $p = 0.135$.

Mental wellbeing was significantly higher in the experimental group (5.11 ± 1.2) compared to the control group (4.46 ± 1.56), a mean difference of 0.64 (95% CI, 0.117 to 1.167), $t(108) = 2.42$, $p = 0.009$, a medium effect ($d = 0.478$, 95% CI, 0.085 to 0.868).

Coping self-efficacy was significantly higher in the experimental group (4.8 ± 1.19) compared to the control group (3.99 ± 1.56), a mean difference of 0.81 (95% CI, 0.29 to 1.336), $t(108) = 3.08$, $p = 0.001$, a medium to large effect ($d = 0.61$, 95% CI, 0.212 to 1.001).

There was no significant difference in stress between the experimental group (4.11 ± 1.28) and the control group (4.36 ± 1.46), a mean difference of -0.25 (95% CI, -0.778 to 0.276), $t(108) = -0.944$, $p = 0.174$.

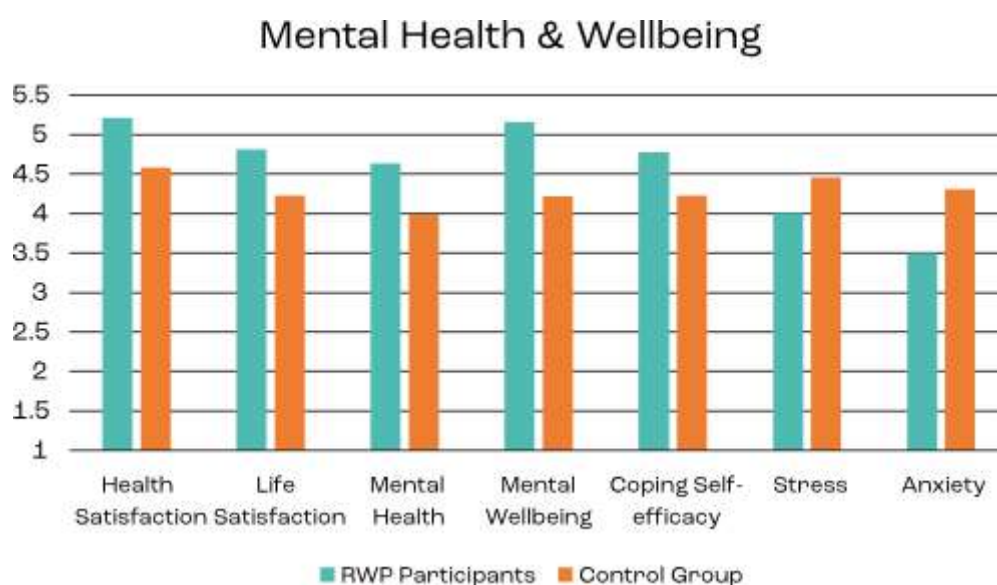
Anxiety was significantly lower in the experimental group (3.61 ± 1.42) compared to the control group (4.35 ± 1.5), a mean difference of -0.74 (95% CI, -1.307 to -0.171), $t(108) = -2.579$, $p = 0.006$, a medium effect ($d = -0.508$, 95% CI, -0.9 to -0.115).

Matched Analysis

	RWP Participants		Control Group		Mean
N	69		41		
	Mean	SD	Mean	SD	Mean
Health Satisfaction	5.21	1.34	4.58	1.4	+0.63*
Life Satisfaction	4.81	1.41	4.23	1.45	+0.58*
Mental Health	4.64	1.14	3.99	1.11	+0.65**
Mental Wellbeing	5.16	1.11	4.22	1.3	+0.94***
Coping Self-efficacy	4.78	1.2	4.23	1.1	+0.55*
Stress	4.01	1.27	4.46	1.06	-0.46*
Anxiety	3.49	1.37	4.31	1.02	-0.82**

*Statistically significant difference, $p < 0.05$
 ***Statistically significant effect, $p < 0.001$

**Statistically significant difference, $p = 0.01$



Health satisfaction was significantly higher in the experimental group (5.21 ± 1.34) compared to the control group (4.58 ± 1.4), a mean difference of 0.63 (95% CI, 0.045 to 1.205), $t(47) = 2.169$, $p = 0.018$, a small to medium effect ($d = 0.31$, 95% CI, 0.022 to 0.601).

Life satisfaction was significantly higher in the experimental group (4.81 ± 1.41) compared to the control group (4.23 ± 1.45), a mean difference of 0.58 (95% CI, 0.019 to 1.148), $t(47) = 2.079$, $p = 0.022$, a small to medium effect ($d = 0.3$, 95% CI, 0.009 to 0.588). This effect was not evident when covariates were not controlled for.

Mental health was significantly higher in the experimental group (4.64 ± 1.14) compared to the control group (3.99 ± 1.11), a mean difference of 0.65 (95% CI, 0.186 to 1.106), $t(47) = 2.825$, $p = 0.003$, a small to medium effect ($d = 0.41$, 95% CI, 0.111 to 0.7). This effect was not evident when covariates were not controlled for.

Mental wellbeing was significantly higher in the experimental group (5.16 ± 1.11) compared to the control group (4.22 ± 1.3), a mean difference of 0.94 (95% CI, 0.416 to 1.47), $t(47) = 3.6$, $p < 0.001$, a medium effect ($d = 0.52$, 95% CI, 0.215 to 0.819).

Coping self-efficacy was significantly higher in the experimental group (4.78 ± 1.2) compared to the control group (4.23 ± 1.1), a mean difference of 0.55 (95% CI, 0.057 to 1.047), $t(47) = 2.243$, $p = 0.015$, a small to medium effect ($d = 0.32$, 95% CI, 0.032 to 0.613).

Stress was significantly lower in the experimental group (4.01 ± 1.27) compared to the control group (4.47 ± 1.06), a mean difference of -0.464 (95% CI, -0.984 to 0.057), $t(47) = -1.791$, $p = 0.04$, a small effect ($d = -0.26$, 95% CI, -0.545 to -0.03). This effect was not evident when covariates were not controlled for.

Anxiety was significantly lower in the experimental group (3.49 ± 1.37) compared to the control group (4.31 ± 1.02), a mean difference of -0.82 (95% CI, -1.355 to -0.28), $t(47) = -3.06$, $p = 0.002$, a small to medium effect ($d = -0.44$, 95% CI, -0.736 to -0.143).

PHYSICAL ACTIVITY & HEALTH FINDINGS

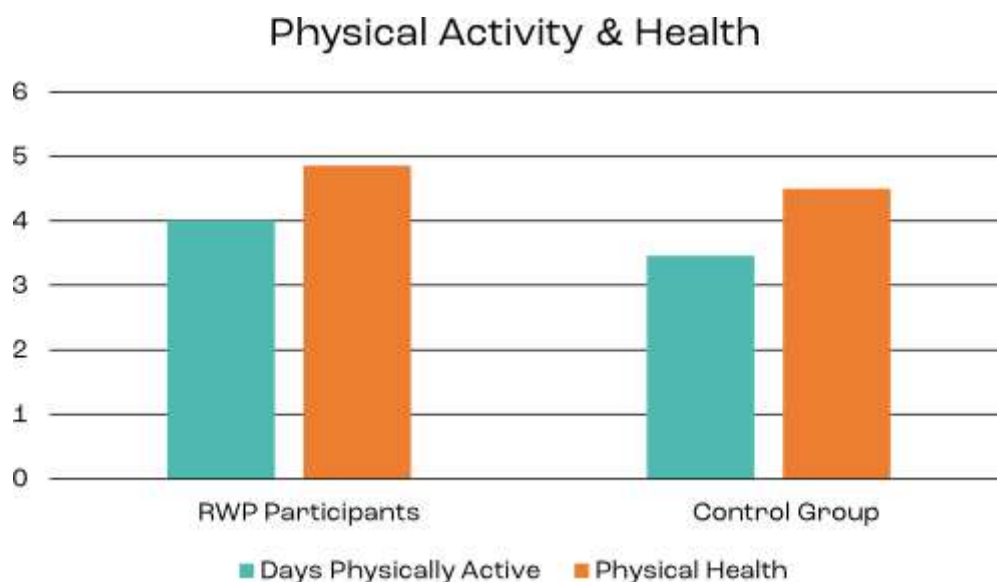
10



Physical Activity & Health Findings

Unmatched Analysis

	RWP Participants		Control Group		Mean
N	48		48		
	Mean	SD	Mean	SD	Mean
Days Physically Active	4.01	1.94	3.46	2.1	+0.55
Physical Health	4.86	1.34	4.5	1.29	+0.36



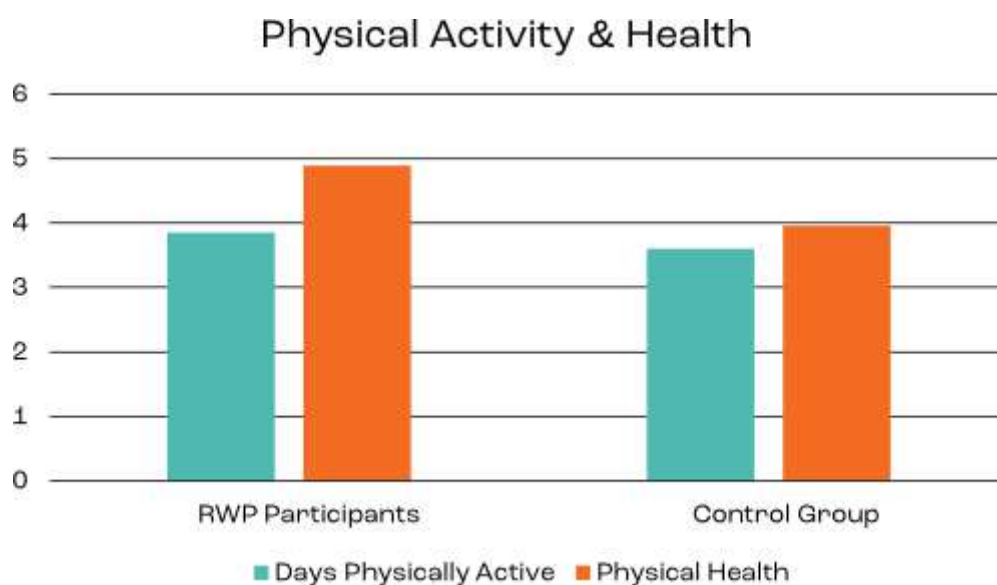
There was no significant difference in days physically active between the experimental group (4.01 ± 1.94) and the control group (3.46 ± 2.1), a mean difference of 0.55 (95% CI, -0.232 to 1.334), $t(108) = 1.395$, $p = 0.083$.

There was no significant difference in physical health between the experimental group (4.86 ± 1.34) and the control group (4.5 ± 1.29), a mean difference of 0.36 (95% CI, -0.158 to 0.877), $t(108) = 1.376$, $p = 0.086$.

Matched Analysis

	RWP Participants		Control Group		Mean
N	48		48		
	Mean	SD	Mean	SD	Mean
Days Physically Active	3.85	2.04	3.6	1.77	+0.25
Physical Health	4.89	1.38	3.96	1.08	+0.93*

*Statistically significant effect, $p < 0.001$



There was no significant difference in days physically active between the experimental group (3.85 ± 2.03) and the control group (3.6 ± 1.77), a mean difference of 0.25 (95% CI, -0.55 to 1.05), $t(47) = 0.628$, $p = 0.266$.

Physical health was significantly higher in the experimental group (4.89 ± 1.38) compared to the control group (3.96 ± 1.08), a mean difference of 0.93 (95% CI, 0.387 to 1.474), $t(47) = 3.442$, $p < 0.001$, a medium effect ($d = 0.5$, 95% CI, 0.194 to 0.795). This effect was not evident when covariates were not controlled for.

RANKING OF EFFECTS

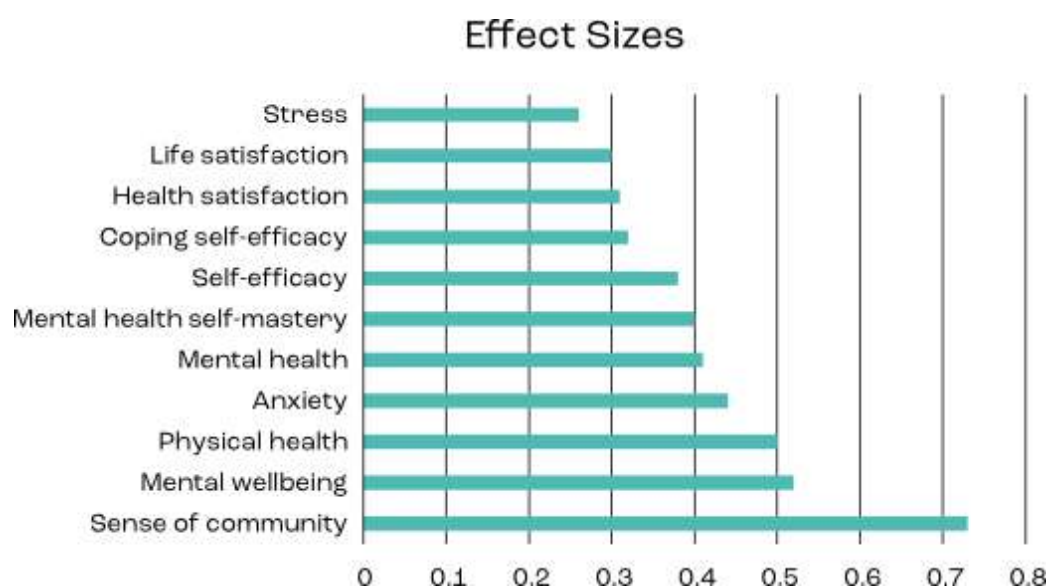
11



Ranking of Effects

Rollin' with the Punches had a positive effect on 11 out of 14 variables. The program had no effect on positive relationships, self-esteem or number of days physically active.

Rank	Variable	d
1.	Sense of community	0.73
2.	Mental wellbeing	0.52
3.	Physical health	0.5
4.	Anxiety	-0.44
5.	Mental health	0.41
6.	Mental health self-mastery	0.4
7.	Self-efficacy	0.38
8.	Coping self-efficacy	0.32
9.	Health satisfaction	0.31
10.	Life satisfaction	0.3
11.	Stress	-0.26



Of the variables for which there was a positive effect, Rollin' with the Punches had the greatest effect on sense of community, followed by mental wellbeing, physical health, anxiety, mental health, mental health self-mastery, self-efficacy, coping self-efficacy, health satisfaction, life satisfaction and stress.

QUALITATIVE FINDINGS

12



Theme #1: Fragile participants seeking alternative treatment

Fragile participants. The programme recruited participants with various mental health problems, including problems that made participants unstable and fragile, requiring medication.

“I have depression, anxiety, EUPD often known as Borderline Personality Disorder and I also have issues with dissociation and psychosis when I’m very, very ill.”

“I suffer with poor mental health, I have done throughout my whole life really.”

“Turbulent. Very, very turbulent. I was emotionally, should I say, unstable.”

“My husband has a mental health disability and I had been struggling with caring for him for a long period of time and he was very, very ill and I used alcohol as a way of dealing with that, so I was quite fragile”

“I had a very bad break up and experienced some domestic violence, requiring that I be on anti-depressants.”

Seeking alternative treatment. Participants were either talking prescribed medication for their mental health problems or self-medicating with other substances, but wanted an alternative treatment.

“Eh, well before I handled it badly, I self-medicated, with alcohol and smoking and things.”

“Before boxing, I was medicating too much on tablets from the doctor. And, and I was drinking a little too much as well. I wanted to do something else.”

I had clinical depression, but I didn’t want to take medicine because I feel that was just a plaster.”

Theme #2: Happy and confident individuals with something to look forward to and who are less reliant upon medications and other substances

Happy and confident participants. Consistent with the quantitative findings, participants reported improvements in their mental health, most commonly that they felt happier and more confident, providing something to look forward to.

“I definitely feel a lot happier in general [...] I’ve been meeting up with others outside of the course, so that’s really great[...] The course has, yeah, changed the way I’ve been thinking and behaving.”

“I’ve never, ever felt sorry I went boxing. Only ever felt sorry if I didn’t go boxing. Always felt twenty times better than I did before I went in.”

“Rollin’ with the Punches gave me a focus, goals and it made me feel good when I achieve those in the gym.”

“Increased my confidence, increased my fitness, better moods, better stability of my moods definitely and better stability of my sleep.”

“It’s making me be more confident around town and with people. So it’s got my confidence level up. It’s got me thinking more positive.”

Something to look forward to. Rollin' with the Punches enhanced the mental health of participants by giving them something to look forward to that involved getting out of the house and socializing.

"I enjoy every day whereas before, in the past when I was quite depressed, I wasn't looking forward to getting up. [...] Coming here [Rollin' with the Punches], it gives you something to look forward to."

"It's given me something to look forward to like it's given me a routine."

"The changes that I feel are all down to the course coz I would still be in bed, not out of bed."

"It gave me a focus and it got me out of the house to socialize."

"Taking part and being part of the sessions, doing that three times a week just makes a massive difference to mental health and stuff. So instead of, sitting at home, watching TV, smoking or whatever, you're down at the gym doing something really productive. And so really healthy mentally and physically."

"If this project wasn't here I'll be still sitting at my house, feeling depressed. [...] The most significant change was that I went through a break-up last year. And it was terrible. It got me so bad that I had to be referred, but because I was coming here and doing my boxing, having conversations with [coach], that stuff kept me mentally sane and stable. I would probably have to still be engaging with mental services now. But I didn't have to because I've been here."

Reducing reliance on medication and other substances. Participants reported that the effectiveness of the programme reduced the need for them to take medication and use other substances in attempting to deal with their mental health problems:

"I don't have to take medication and stuff anymore."

"I've come off anti-depressants now. I've also stopped smoking. I'm vaping now, which is a major improvement [...] I'm off the anti-depressants."

"Being part of Fight4Change, that's given me strength to reengage with services and take my health more seriously and do a successful alcohol detox and I've now been alcohol-free for 4 months."

Theme #3: A caring sense of community with people on a similar path

A sense of community amongst participants. Participating on the programme with others with similar problems and who have experienced similar things provided common ground from which a sense of community was developed, which is consistent with the quantitative findings and research by Hefferon et al. (2013) which found that boxing facilitated a sense of community amongst participants with mental health problems. The additionality of a WhatsApp group for participants really extend this sense of community to outside of the sessions. Participants encouraged each others, checked in on each other and shared information.

"Being in a positive environment really helped me [...] Really just being around other people on a similar path."

"Camaraderie, the community spirit, you know, all of us have been through something in life. You can feel it. There was a few vulnerable people in the same place, and, you know, you felt better that if they made it and you made it, then you're doing good."

"I started a WhatsApp group for everyone to join so that everyone in the group can communicate and so that everyone could encourage each other to attend the sessions and stuff."

“It’s made me feel good. I’ve met some good people on the programme that hopefully I will stay in contact for many years to come. I’ve made some friends for life.”

“I do think it brings you into contact with people in your community that you will not normally be in contact with. And I think there is something very powerful about that.”

Supportive and caring staff. Participants reported immense gratitude to programme staff, who they felt were genuinely supportive and caring.

“They [Rollin’with the Punches staff] actually care about you. They ask about you when you’re not here. They actually care. [...] I’ve been to plenty of gyms and nobody cares if you don’t come for 3 days, especially when you’re socially-isolated, you feel who’s gonna care if I don’t turn up?”

“Everybody supports each other. I just find everyone supportive. They [Rollin’with the Punches staff] don’t just help you while they’re there, they give you time when you’re not there. They contact you if they don’t see you. You’re still on their mind and in their thoughts to make sure you’re okay. So they’re always encouraging you to see where you are in your world. So that’s what I like about them. They never forget about you.”

“I just think it was the care and support of my group. The people who run the programmes were there for us if we needed them. You feel supported to face some challenges.”

Encouraging coaches. The coaches were able to work with participants of differing abilities and encouraged them to progress from their respective level.

“At the end we’d basically check in with everybody and be like, ‘you alright?’ ‘how you feeling, how was that, he’d [the coach] give you some encouragement and let you know last week, you did this, which was great but now you did this this week, which was even better. And you walk away feeling like nice and buzzed and you’ve had a nice chit chat and you feel a hundred times better.”

“I think generally it’s the people. It’s the chats. It’s the talking and the encouragement from the coach. And he just makes you feel like, yeah, everything we have here is for you and it’s fine and whatever you come here with, we can do something with it. If you can lift up your leg up to your knee, that’s fine. If you can only lift up your leg up to your ankle, that’s also fine. We start where you’re at and build on it.”

Theme #4: Boxing as a stimulant or alternative

Boxing as a stimulant. Participants reported that the boxing training they engaged in served as a replacement stimulant for them, providing an endorphin and energy boost that made them feel good, which is consistent with previous research that physical activity enhances mental health through stimulation of endorphins (Stephens, 1988; Camacho et al., 1991; Pederson & Ullum, 1994; Paluska & Schwenk, 2000; Strawbridge, et al., 2002; Peluso & Andrade, 2005).

“I loved the boxing, the endorphin buzz that gave it to me.”

“Boxing is very good in terms of being present in the moment and releasing endorphins, just giving you that kind of intense euphoria.”

“I loved the pad workout because of the positivity and the energy that was around it. The feel good factor.”

“I think it just gives you such a high at the end of the day [laugh] like a really natural high [laughs]. Boxing - it's a natural high.”

“When I've gone training, I've completed something. So I've, accomplished something for the day. It lets go of certain chemicals inside of you, inside of your brain and it's a feel-good factor. Well it's hard to explain, but it's a beautiful joy to feel.”

Boxing as an alternative. Participants also reported that the physicality of boxing training they engaged in required them to cease incompatible unhealthy behaviours or even occupy them in a way that distracted them from depressive thoughts.

“I don't drink no more. I stopped smoking because I realized with the smoking and the training, it doesn't really go together.”

“It's very hard to be depressed and be in your own head when your body is screaming at you because you're doing so many squats [laughs]. It's very difficult to be depressed when your body is just like Oh my God! [laughs] So pick your struggles, you are in your head or you're in your body. Which one is it?”

“So when you are like in that space where you're physically exhausted, there are certain things that I don't engage with mentally. So I could be angry or depressed or overthinking something. But by the time I've finished that class, I ain't thinking about that no more. I'm at home, having a shower, eating some decent food, doing my self-care and you are taking a bit more care of yourself as well.”

Theme #5: Boxing as an outlet

Boxing as an outlet for anger. Nearly all participants reported that boxing had been effective for their mental health as it had served as an outlet for anger and frustration, as well as helping to control anger. This finding is consistent with the finding of van Inglen (2011) that that boxing serves as a safe emotional outlet and release of anger.

“So like for me, like the physical side of the boxing, I really enjoy it because it lets out all that kind of frustration and anger in kind of a healthy way.”

“It lets you get rid of your anger. You know like, on the punching bag, you can punch on the punching bag without hurting anyone. [...] It's a good thing to release stress from your body.”

“It's a good way to get out aggression. I don't wanna hit anyone, but sometimes you know, somebody bumps into you and they are rude to you on the bus or in the street, you can't hit them, but you come here and you hit a bag. [...] It feels good to release that pent up anger and eh put it to good use to make me happy.”

“When you're boxing, you take it out on your frustration. It helps me to release my frustration, physically. I'd come to boxing like angry or depressed and then literally wake my body up and then it literally lifted my mood.”

“If you’re thinking about a breakup. There’s nothing that cures it better than a boxing sesh [...] smacked it out and got out all of the frustration [...] express it out.”

“Like having mental health is really frustrating. Coming up against the barrier in whatever you do and it’s really difficult so makes you angry and frustrated [...] Boxing is a really great way of releasing all that anger and stress.”

“It’s like the emotional release of punching the bag. It’s about controlling you anger and aggression as well.”

Boxing as an outlet for stress. The boxing training also served as an outlet for stress, so to calm down and anxiety and even help participants sleep better. This finding is consistent with the finding of van Inglen (2011) that that boxing serves as a safe emotional outlet and release of stress.

“Ah just releasing stress, tension, and calming down anxiety.”

“When I’m done getting all my frustrations out, it’s like I’m a completely new person.”

“It’s [boxing] an amazing way to release steam out of your body, negativity, with the punch bags.”

“It’s just such a physical release. The contact with the gloves on the bag, the releasing on impact, keeping time with the music, with the beat and the breathing.”

“I’d leave here, like you know, less anxious, physically exhausted but it helped my sleep. My sleep was beautiful. You know anyone with mental health issues, sleep is often a struggle.”

Theme #6: Boxing as an analogy

Reflecting the use of sport as an analogy (Hills, et al., 2019), Rollin with the Punches was used as an analogy whereby participants learned something from boxing that they could then use to tackle their mental health problems or other difficulties in their lives.

“It’s much more about fighting as it were [laughs] because I think we’re always fighting things and it’s really hard. Life is really, really challenging.”

“The coach asks us to do ten punches, then they ask for one more. Just like in life, give me one more, keep going. They teach us certain skills with different drills. Like teaching us to slip a the punch, just like in life, you move to the side, you miss that curve ball. Just finding different ways of working and looking at things.”

This finding builds upon the finding of Morton et al. (2019) that the boxer identity, that of being a fighter, was an appropriate alternative to the addict identity.

CONCLUSIONS & IMPLICATIONS

13



Findings

Rollin' with the Punches had a significant effect on 11 out of the 14 variables studied. It's greatest effect was on facilitating a sense of community, where the programme had a medium to large effect ($d = 0.73$), amongst participants, which was echoed in the qualitative findings that identified the importance of being with people on a similar path and the supportive and caring nature of programme staff. The programme also had a medium effect size on mental wellbeing ($d = 0.52$) and physical health ($d = 0.5$), demonstrating the duality of its effectiveness. Small to medium effects were found for the other significant variables, including anxiety reduction ($d = -0.44$), mental health ($d = 0.41$), mental health self-mastery ($d = 0.4$), self-efficacy ($d = 0.38$), coping self-efficacy ($d = 0.32$), health satisfaction ($d = 0.31$), life satisfaction ($d = 0.3$) and stress reduction ($d = -0.26$). These effects made participants less reliant upon medications and other substances being used to self-medicate. The use of boxing was found to be effective in treating mental health because it served as a stimulant, as consistent with research that established physical activity as a stimulant (Stephens, 1988; Camacho et al., 1991; Pederson & Ullum, 1994; Paluska & Schwenk, 2000; Strawbridge, et al., 2002; Peluso & Andrade, 2005), and because it serves as an alternative to unhealthy behaviours, which are incompatible with being physically active through boxing. However, these mechanisms are not unique to boxing and would operate with any physical activity intervention. However, where boxing was found to be unique was in its ability to serve as an outlet for anger and stress through punching a bag, which echoes the findings of van Inglen (2011). Furthermore, boxing was effectively used as an analogy, in particular with regard to being a fighter and rolling with the punches from mental health problems, echoing the findings of Morton et al. (2019) that the boxer identity was an appropriate alternative to the addict identity.

Implications

This study has conclusively evidenced the effectiveness of Rollin' with the Punches as an intervention for tackling mental health problems, whilst simultaneously improving the physical health and social and mental wellbeing of participants. This study adds to the evidence that physical activity is an effective non-medical intervention for mental health problems (Penedo & Dahn, 2005; Richardson, et al., 2005), but goes further by establishing that boxing is a particularly effective form of physical activity because of its ability to serve as an outlet for anger and stress and because it provides a rich tapestry of analogies to teach skills and values for boxing that can be reframed to make participants fighters able to cope with the challenges of their mental illness. Such benefits from boxing cannot be assumed (Coalter, 2013), rather boxing needs to be intentionally designed so to achieve the desired change in participants (Bruening, et al., 2013), such as how boxing analogies can support mental health sufferers (Hills, et al., 2018).

Limitations

It would have been unethical to deny individuals access to an intervention that may alleviate deficiencies in their life (Hakim, 2000). Therefore, to measure the effect of Rollin' with the Punches a quasi-experiment survey design was adopted, whereby data was collected by a digital questionnaire from Rollin' with the Punches participants and a control group (i.e., equivalent individuals who did not participate in the programme). As such, without random allocation to condition, this study is subject to selection bias. Although several observed covariates were held constant in the statistical matching of experimental and control units, there remains unobserved differences between conditions, thus some selection bias remains. Furthermore, the propensity score matching undertaken allowed for a tolerance level of a 0.02 difference in propensity scores to match units, which is a 'fuzzy' matching approach that allows for some differences between conditions even on the units studied. Greater accuracy of matching could be achieved with a larger control pool to match against experimental units.

Future Research

This was a study of the pilot of Rollin' with the Punches with 62 participants. Having evidenced its effectiveness, this programme should be expanded. Future research could benefit from a larger sample of experimental and control units, which, due to more data, would allow for more accurate matching and less selection bias. A greater sample size would also allow for segmenting of the data to offer additional insights such as the effect of the programme on different mental health programmes. In the current study participants reported ten different mental health problems, but only anxiety and depression were experienced by a majority of participants.

REFERENCES

14



References

- Adler, P. A., & Adler, P. (1994). Observational techniques. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (p. 377–392). Sage Publications, Inc.
- Bailey, R., Hillman, C., Arent, S., & Petitpas, A. (2013). Physical activity: An underestimated investment in human capital?. *Journal of physical activity and health*, *10*(3), 289-308.
- Becker, H. S. (1996). The epistemology of qualitative research. *Ethnography and human development: Context and meaning in social inquiry*, *27*, 53-71.
- Biddle, S. J., & Asare, M. (2011). Physical activity and mental health in children and adolescents: a review of reviews. *British journal of sports medicine*, *bjsports90185*.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, *3*(2), 77-101.
- Brodie, I., Goldman, R., & Clapton, J. (2011). *Mental health service transitions for young people*. London: Social Care Institute for Excellence.
- Bruening, J. E., Peachey, J. W., Evanovich, J. M., Fuller, R. D., Murty, C. J. C., Percy, V. E., ... & Chung, M. (2015). Managing sport for social change: The effects of intentional design and structure in a sport-based service learning initiative. *Sport Management Review*, *18*(1), 69-85.
- Burtless, G. (1995). The case for randomized field trials in economic and policy research. *Journal of economic perspectives*, *9*(2), 63-84.
- Camacho, T. C., Roberts, R. E., Lazarus, N. B., Kaplan, G. A., & Cohen, R. D. (1991). Physical activity and depression: evidence from the Alameda County Study. *American journal of epidemiology*, *134*(2), 220-231.
- Cartwright, N. (2007). *Hunting causes and using them: Approaches in philosophy and economics*. Cambridge University Press.
- Chandola, T., Britton, A., Brunner, E., Hemingway, H., Malik, M., Kumari, M., ... & Marmot, M. (2008). Work stress and coronary heart disease: what are the mechanisms?. *European heart journal*, *29*(5), 640-648.
- Cheema, B. S., Davies, T. B., Stewart, M., Papalia, S., & Atlantis, E. (2015). The feasibility and effectiveness of high-intensity boxing training versus moderate-intensity brisk walking in adults with abdominal obesity: a pilot study. *BMC sports science, medicine and rehabilitation*, *7*(1), 1-10.
- Chesney, M. A., Neilands, T. B., Chambers, D. B., Taylor, J. M., & Folkman, S. (2006). A validity and reliability study of the coping self efficacy scale. *British journal of health psychology*, *11*(3), 421-437.
- Chlan, L., Savik, K., & Weinert, C. (2003). Development of a shortened state anxiety scale from the Spielberger State-Trait Anxiety Inventory (STAI) for patients receiving mechanical ventilatory support. *Journal of nursing measurement*, *11*(3), 283-293.
- Coalter, F. (2013). *Sport for development: What game are we playing?*. Routledge.
- Cohen, J. (1992). Statistical power analysis. *Current directions in psychological science*, *1*(3), 98-101.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of health and social behavior*, 385-396.

- Corrigan, P. W. (2005). *On the stigma of mental illness: Practical strategies for research and social change*. American Psychological Association.
- Creswell, J. (2012). *Qualitative inquiry and research design: Choosing from five methods*. Thousand Oaks, CA: Sage
- Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into practice*, 39(3), 124-130.
- Creswell, J. W., Plano Clark, V. L., Gutmann, M. L., & Hanson, W. E. (2003). Advanced mixed methods research designs. *Handbook of mixed methods in social and behavioral research* (pp. 209–240).
- Daumit, G. L., Goldberg, R. W., Anthony, C., Dickerson, F., Brown, C. H., Kreyenbuhl, J., ... & Dixon, L. B. (2005). Physical activity patterns in adults with severe mental illness. *The Journal of nervous and mental disease*, 193(10), 641-646.
- Deacon, B. J. (2013). The biomedical model of mental disorder: A critical analysis of its validity, utility, and effects on psychotherapy research. *Clinical psychology review*, 33(7), 846-861.
- Deacon, B. J., & McKay, D. (2015). The biomedical model of psychological problems: A call for critical dialogue. *Lancet*, 16, 2-3.
- Deaton, A. (2010). Understanding the mechanisms of economic development. *Journal of Economic Perspectives*, 24(3), 3-16.
- Denzin, N. K., & Lincoln, Y. S. (Eds.). (2011). *The Sage handbook of qualitative research*. Thousand Oaks, CA: Sage.
- Elliott, M. N., Kanouse, D. E., Burkhart, Q., Abel, G. A., Lyratzopoulos, G., Beckett, M. K., ... & Roland, M. (2015). Sexual minorities in England have poorer health and worse health care experiences: a national survey. *Journal of general internal medicine*, 30, 9-16.
- Feldman, D. B., & Crandall, C. S. (2007). Dimensions of mental illness stigma: What about mental illness causes social rejection? *Journal of Social and Clinical Psychology*, 26(2), 137-154.
- Firestone, W. A. (1993). Alternative arguments for generalizing from data as applied to qualitative research. *Educational researcher*, 22(4), 16-23.
- Fox, K. R. (1999). The influence of physical activity on mental well-being. *Public health nutrition*, 2(3a), 411-418.
- Gammage, K. L., van Ingen, C., & Angrish, K. (2022). Measuring the effects of the shape your life project on the mental and physical health outcomes of survivors of gender-based violence. *Violence against women*, 28(11), 2722-2741.
- Ghaffar, A., Gallagher, R., Ketigian, L., Rubin, L., Scheid, Z., Zhu, J., ... & Leder, A. (2020). Effect of Non-contact Boxing on Non-motor Symptoms in Parkinson's Disease (445).
- Greene, J. C., & Caracelli, V. J. (1997). Defining and describing the paradigm issue in mixed-method evaluation. *New directions for evaluation*, 74, 5-17.
- Hakim, C. (2000). *Research design: Successful designs for social and economic research*. London: Routledge.
- Harris, C., & Barraclough, B. (1998). Excess mortality of mental disorder. *The British journal of psychiatry*, 173(1), 11-53.

- Hays, R. D., Schalet, B. D., Spritzer, K. L., & Cella, D. (2017). Two-item PROMIS® global physical and mental health scales. *Journal of patient-reported outcomes*, 1(1), 2.
- Hefferon, K., Mallery, R., Gay, C., & Elliott, S. (2013). 'Leave all the troubles of the outside world': a qualitative study on the binary benefits of 'Boxercise' for individuals with mental health difficulties. *Qualitative research in sport, exercise and health*, 5(1), 80-102.
- Hermanns, M., Mastel-Smith, B., Donnell, R., Quarles, A., Rodriguez, M., & Wang, T. (2021). Counterpunching to improve the health of people with Parkinson's disease. *Journal of the American Association of Nurse Practitioners*, 33(12), 1230-1239.
- Hills, S., Gomez Velasquez, A., & Walker, M. (2018). Sport as an analogy to teach life skills and redefine moral values: A case study of the 'Seedbeds of Peace'sport-for-development programme in Medellin, Colombia. *Journal of Sport for Development*, 6(10), 19-31.
- Imai, K., Keele, L., Tingley, D., & Yamamoto, T. (2011). Unpacking the black box of causality: Learning about causal mechanisms from experimental and observational studies. *American Political Science Review*, 105(4), 765-789.
- Ivankova, N. V., Creswell, J. W., & Stick, S. L. (2006). Using mixed-methods sequential explanatory design: From theory to practice. *Field methods*, 18(1), 3-20.
- Janssen, I., & LeBlanc, A. G. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *International Journal of Behavioral nutrition and physical activity*, 7(1), 40.
- Jerusalem, M., & Schwarzer, R. (1995). Generalized self-efficacy scale. *Measures in health psychology: A user's portfolio. Causal and control beliefs*, 35-37.
- Jin, P. (1989). Changes in heart rate, noradrenaline, cortisol and mood during Tai Chi. *Journal of psychosomatic research*, 33(2), 197-206.
- Johnson, B., & Turner, L. A. (2003). Data collection strategies in mixed methods research. *Handbook of mixed methods in social and behavioral research*, 297-319.
- Jormann, J., & Gotlib, I. H. (2010). Emotion regulation in depression: relation to cognitive inhibition. *Cognition and Emotion*, 24(2), 281-298.
- Luszczynska, A., Gutiérrez Doña, B., & Schwarzer, R. (2005). General self efficacy in various domains of human functioning: Evidence from five countries. *International journal of Psychology*, 40(2), 80-89.
- Lyon, D., Owen, S., Osborne, M., Blake, K., & Andrades, B. (2020). Left/Write//Hook: A mixed method study of a writing and boxing workshop for survivors of childhood sexual abuse and trauma. *International Journal of Wellbeing*, 10(5).
- Marshall, G. N., & Lang, E. L. (1990). Optimism, self-mastery, and symptoms of depression in women professionals. *Journal of personality and social psychology*, 59(1), 132.
- Maxwell, J. A. (2012). *Qualitative research design: An interactive approach* (Vol. 41). Sage publications.
- McDevitt, J., Snyder, M., Miller, A., & Wilbur, J. (2006). Perceptions of barriers and benefits to physical activity among outpatients in psychiatric rehabilitation. *Journal of Nursing Scholarship*, 38(1), 50-55.
- McManus, S., Bebbington, P. E., Jenkins, R., & Brugha, T. (2016). *Mental health and wellbeing in England: the adult psychiatric morbidity survey 2014*. NHS digital.

- McMillan, D. W., & Chavis, D. M. (1986). Sense of community: A definition and theory. *Journal of community psychology*, 14(1), 6-23.
- Mind. (2018). 40 per cent of all GP appointments about mental health. Mind. <https://www.mind.org.uk/news-campaigns/news/40-per-cent-of-all-gp-appointments-about-mental-health/>
- Moore, L. L., Gao, D., Bradlee, M. L., Cupples, L. A., Sundarajan-Ramamurti, A., Proctor, M. H., ... & Ellison, R. C. (2003). Does early physical activity predict body fat change throughout childhood?. *Preventive medicine*, 37(1), 10-17.
- Morton, S., O'Brien, K., & O'Reilly, L. (2019). Boxing and substance use rehabilitation: building skills and capacities in disadvantaged communities. *Community development journal*, 54(3), 541-559.
- Myers, J. (2003). Exercise and cardiovascular health. *Circulation*, 107(1), e2-e5.
- Nabkasorn, C., Miyai, N., Sootmongkol, A., Junprasert, S., Yamamoto, H., Arita, M., & Miyashita, K. (2006). Effects of physical exercise on depression, neuroendocrine stress hormones and physiological fitness in adolescent females with depressive symptoms. *European journal of public health*, 16(2), 179-184.
- Naylor, C., Das, P., Ross, S., Honeyman, M., Thompson, J, & Gilbert, H. (2016). Bringing together physical and mental health: A new frontier for integrated care. Kings Fund. <https://www.kingsfund.org.uk/publications/physical-and-mental-health>
- NHS. (2017) Five year forward view for mental health: One year on. NHS. <https://www.england.nhs.uk/wp-content/uploads/2017/03/fyfv-mh-one-year-on.pdf>
- Ohara-Hirano, Y., Kaku, T., Hirakawa, T., Noguchi, Y., Hirata, N., Shinkoda, H., ... & Ohki, M. (2004). Uterine cervical cancer: a holistic approach to mental health and it's socio-psychological implications. *Fukuoka igaku zasshi= Hukuoka acta medica*, 95(8), 183-194.
- ONS. (2019). Disability, well-being and loneliness, UK: 2019. Office for National Statistics. <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/disability/bulletins/disabilitywellbeingandlonelinessuk/2019>
- Paluska, S. A., & Schwenk, T. L. (2000). Physical activity and mental health. *Sports medicine*, 29(3), 167-180.
- Pasquali, E. A., Arnold, H. M., & DeBasio, N. (1989). *Mental health nursing: A holistic approach*. CV Mosby.
- Pedersen, B. K., & Ullum, H. (1994). NK cell response to physical activity: possible mechanisms of action. *Medicine and science in sports and exercise*, 26(2), 140-146.
- Peluso, M. A. M., & Andrade, L. H. S. G. D. (2005). Physical activity and mental health: the association between exercise and mood. *Clinics*, 60(1), 61-70.
- Penedo, F. J., & Dahn, J. R. (2005). Exercise and well-being: a review of mental and physical health benefits associated with physical activity. *Current opinion in psychiatry*, 18(2), 189-193.
- Peterson, N. A., Speer, P. W., & McMillan, D. W. (2008). Validation of a brief sense of community scale: Confirmation of the principal theory of sense of community. *Journal of community psychology*, 36(1), 61-73.
- Public Health England. (2019) 2. Mental health: environmental factors. Public Health England. <https://www.gov.uk/government/publications/better-mental-health-jsna-toolkit/2-understanding-place>
- Richardson, C. R., Faulkner, G., McDevitt, J., Skrinar, G. S., Hutchinson, D. S., & Piette, J. D. (2005). Integrating physical activity into mental health services for persons with serious mental illness. *Psychiatric services*, 56(3), 324-331.

- Rosenberg, M. (1965). Rosenberg self-esteem scale (RSE). Acceptance and commitment therapy. Measures package, 61(52), 18.
- Rubin, H. J., & Rubin, I. S. (2005). *Qualitative Interviewing: The Art of Hearing Data* (2nd ed.). Thousand Oaks, CA: Sage.
- Rüsch, N., Angermeyer, M. C., & Corrigan, P. W. (2005). Mental illness stigma: concepts, consequences, and initiatives to reduce stigma. *European psychiatry*, 20(8), 529-539.
- Shultz, S. P., Stoner, L., Lambrick, D. M., & Lane, A. M. (2014). A boxing-oriented exercise intervention for obese adolescent males: Findings from a pilot study. *Journal of sports science & medicine*, 13(4), 751.
- Smith, R. E., & Smoll, F. L. (1990). Self-esteem and children's reactions to youth sport coaching behaviors: A field study of self-enhancement processes. *Developmental Psychology*, 26(6), 987.
- Spiggle, S. (1994). Analysis and interpretation of qualitative data in consumer research. *Journal of consumer research*, 21(3), 491-503.
- Sport England's Single Item Measure (SIM)
- Stephens, T. (1988). Physical activity and mental health in the United States and Canada: evidence from four population surveys. *Preventive medicine*, 17(1), 35-47.
- Stewart-Brown, S., Tennant, A., Tennant, R., Platt, S., Parkinson, J., & Weich, S. (2009). Internal construct validity of the Warwick-Edinburgh mental well-being scale (WEMWBS): a Rasch analysis using data from the Scottish health education population survey. *Health and quality of life outcomes*, 7(1), 1-8.
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research techniques*. Thousand Oaks, CA: Sage publications.
- Strawbridge, W. J., Deleger, S., Roberts, R. E., & Kaplan, G. A. (2002). Physical activity reduces the risk of subsequent depression for older adults. *American journal of epidemiology*, 156(4), 328-334.
- Taylor, S. M., & Dear, M. J. (1981). Scaling community attitudes toward the mentally ill. *Schizophrenia bulletin*, 7(2), 225-240.
- Thornicroft, G. (2013). Premature death among people with mental illness. *Bmj*, 346.
- Trost, S. G., Owen, N., Bauman, A. E., Sallis, J. F., & Brown, W. (2002). Correlates of adults' participation in physical activity: review and update. *Medicine & science in sports & exercise*, 34(12), 1996-2001.
- Usher, M., Stanbury, L., Cheeseman, V., & Faulkner, G. (2007). Physical activity preferences and perceived barriers to activity among persons with severe mental illness in the United Kingdom. *Psychiatric services*, 58(3), 405-408.
- van Ingen, C. (2011). Spatialities of anger: Emotional geographies in a boxing program for survivors of violence. *Sociology of Sport Journal*, 28(2), 171-188.
- Warburton et al. (2006)
- World Health Organization (1998). The World Health Organization quality of life assessment (WHOQOL): development and general psychometric properties. *Social science & medicine*, 46(12), 1569-1585.

APPENDIX I QUESTIONNAIRE

15



Demographics

What is your name (First Name & Surname Initial, e.g. John S)?

Which one of the following best describes your ethnic group or background?

- White
- Mixed
- Asian / Asian British
- Black / Black British
- Other

What is your gender?

- Male
- Female
- Other

What is your age? [Number]

What is your religion, even if you are not currently practising?

- Christian
- Buddhist
- Hindu
- Jewish
- Muslim
- Sikh
- Other
- No religion
- Prefer not to say

Which of the following options best describes how you think of yourself?

- Heterosexual or Straight
- Gay or Lesbian
- Bisexual
- Other
- Prefer not to say

Do you have any physical or mental health conditions or illnesses that have lasted or are expected to last 12 months or more?

- Yes
- No

Do these physical or mental health conditions or illnesses have substantial effect on your ability to do normal daily activities?

- Yes
- No

What is your highest level of education?

- No qualifications
- GCSEs or equivalent
- A Levels or equivalent
- Vocational/work-related qualification
- Bachelors degree
- Professional qualification
- Masters degree
- Doctoral degree

What is your employment status?

- Working as an employee
- Self-employed or freelance
- A furloughed employee
- Unemployed
- Retired
- A student
- Looking after home or family
- Long-term sick or disabled
- Other

What is your home postcode? [Postcode, converted to deprivation decile]**Mental Health Problems****Have you suffered from the following mental health problems in the last year?**

- Anxiety
- Depression
- Post-traumatic stress disorder (PTSD)
- Phobias
- Obsessive-compulsive disorder (OCD)
- Panic disorder/panic attacks
- Antisocial personality disorder (ASPD)
- Borderline personality disorder (BPD)
- Bipolar disorder
- Schizophrenia
- Other:

Have you taken any of the following types of medication for mental health problems in the last year?

- Antianxiety/antipanic medications
- Antidepressants
- Antipsychotics
- Stimulants
- Mood stabilizers
- Other:

Relationships**Positive Relationships (WHO, 1998)**

1. I feel happy about my relationships with my family members
2. I feel satisfied with the relationships I have with my friends
3. I feel satisfied with my ability to support my friends and family members

Scale:

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Somewhat Disagree
- 4 = Neither Disagree Nor Agree
- 5 = Somewhat Agree
- 6 = Agree
- 7 = Strongly Agree

Sense of Community (Peterson, Speer & McMillan, 2008)

1. I can get what I need in this group (your coaches and fellow participants of Rollin' with the Punches)
2. This group helps me fulfil my needs
3. I feel like a member of this group
4. I belong in this group
5. I feel connected to this group
6. I have a good bond with others in this group

Scale:

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Somewhat Disagree
- 4 = Neither Disagree Nor Agree
- 5 = Somewhat Agree
- 6 = Agree
- 7 = Strongly Agree

Self-belief**Mental Health Self-Mastery (Marshall & Lang, 1990) – Adapted to managing mental health**

1. What happens to my mental health mostly depends on me
2. There is really no way I can solve the mental health problems I have
3. I have little control over my mental health
4. I often feel helpless in dealing with my mental health problems
5. There is little I can do to change many of my mental health problems

Scale:

1 = Strongly Disagree

2 = Disagree

3 = Somewhat Disagree

4 = Neither Disagree Nor Agree

5 = Somewhat Agree

6 = Agree

7 = Strongly Agree

Self-esteem (Rosenberg, 1965) – Shortened to 5 items

1. I am a person of worth, equal with others
2. I feel that I have a number of good qualities
3. I feel I do not have much to be proud of
4. I wish I could have more respect for myself
5. I feel useless at times

Scale:

1 = Strongly Disagree

2 = Disagree

3 = Somewhat Disagree

4 = Neither Disagree Nor Agree

5 = Somewhat Agree

6 = Agree

7 = Strongly Agree

Generalised Self-Efficacy (Schwarzer & Jerusalem, 1995)

1. I can always manage to solve difficult problems if I try hard enough
2. It is easy for me to stick to my aims and accomplish my goals
3. I can usually handle whatever comes my way

Scale:

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Somewhat Disagree
- 4 = Neither Disagree Nor Agree
- 5 = Somewhat Agree
- 6 = Agree
- 7 = Strongly Agree

Health & Wellbeing**Health Satisfaction (Group, WHO, 1998)**

- In general, how satisfied are you with your health?

Scale:

- 1 = Highly Dissatisfied
- 2 = Dissatisfied
- 3 = Somewhat Dissatisfied
- 4 = Neither Dissatisfied Nor Satisfied
- 5 = Somewhat Satisfied
- 6 = Satisfied
- 7 = Highly Satisfied

Life Satisfaction (Group, WHO, 1998)

- In general, how satisfied are you with your life?

Scale:

1 = Highly Dissatisfied

2 = Dissatisfied

3 = Somewhat Dissatisfied

4 = Neither Dissatisfied Nor Satisfied

5 = Somewhat Satisfied

6 = Satisfied

7 = Highly Satisfied

PROMIS Global Mental Health (Hays, Schalet, Spritzer, & Cella, 2017)

1. In general, how would you rate your mental health, including your mood and your ability to think?
2. In general, how would you rate your satisfaction with social activities and relationships?

Scale:

1 = Very Poor

2 = Poor

3 = Somewhat Poor

4 = Neither Poor Nor Good

5 = Somewhat Good

6 = Good

7 = Very Good

At present, how often are you bothered by emotional problems? (R)

Scale:

1 = Never

2 = Nearly Never

3 = Rarely

4 = Sometimes

5 = Often

6 = Nearly Always

7 = Always

Coping Self-efficacy (Chesney, et al., 2006)

1. [I am able to] ... Take my mind off unpleasant thoughts
2. ... Keep myself from feeling sad
3. ... Keep myself from getting down in the dumps
4. ... Look for something good in a negative situation

Scale:

1 = Never

2 = Nearly Never

3 = Rarely

4 = Sometimes

5 = Often

6 = Nearly Always

7 = Always

Stress (Perceived Stress Scale, Cohen, 1983)

1. In the last month, how often have you felt nervous and “stressed”?
2. In the last month, how often have you found that you could not cope with all the things that you had to do?
3. In the last month, how often have you felt that you were on top of things?
4. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Scale:

- 1 = Never
- 2 = Nearly Never
- 3 = Rarely
- 4 = Sometimes
- 5 = Often
- 6 = Nearly Always
- 7 = Always

Anxiety (The State-Trait Anxiety Inventory, Spielberger, Gorsuch & Lushene, 1964)

1. I feel calm
2. I feel nervous
3. I feel jittery
4. I am worried

Scale:

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Somewhat Disagree
- 4 = Neither Disagree Nor Agree
- 5 = Somewhat Agree
- 6 = Agree
- 7 = Strongly Agree

Mental Well-being (Warwick-Edinburgh)

1. I've been feeling optimistic about the future
2. I've had energy to spare
3. I've been thinking clearly
4. I've been interested in new things

Scale:

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Somewhat Disagree
- 4 = Neither Disagree Nor Agree
- 5 = Somewhat Agree
- 6 = Agree
- 7 = Strongly Agree

Physical Activity & Health**Physical Activity (Sport England)**

In the past week, on how many days have you done a total of 30 mins or more of physical activity, which was enough to raise your breathing rate? This may include sport, exercise and brisk walking or cycling for recreation or to get to and from places.

- 0 - 7

PROMIS Global Physical Health (Hays, Schalet, Spritzer, & Cella, 2017)

1. To what extent are you able to carry out your everyday physical activities such as walking, climbing stairs, carrying groceries, or moving a chair?

Scale:

- 1 = Not At All
- 2 = With Great Difficulty
- 3 = With Difficulty
- 4 = Somewhat
- 5 = With Ease
- 6 = With Great Ease
- 7 = Completely

In the past 7 days, how would you rate your pain on average? (R)

Scale:

- 1 = Worst Pain Imaginable
- 2 = Very Severe Pain
- 3 = A Lot of Pain
- 4 = Some Pain
- 5 = Little Pain
- 6 = Very Little Pain
- 7 = No Pain

In the past 7 days, how would you rate how tired you get on average?

Scale:

- 1 = Completely Tired
- 2 = Very Tired
- 3 = Tired
- 4 = Somewhat Tired
- 5 = Not Very Tired
- 6 = Not Tired
- 7 = Not At All Tired

APPENDIX II PARTICIPANT INTERVIEW TOPIC GUIDE

16



Recruitment

- How did you hear about Fight4Change's Rollin' with the Punches programme?
- What process did you go through to join the programme (e.g. doctor's referral)?
- How did you feel about starting the programme? Was there any reluctance?

Background

- What was your mental health situation prior to commencing on the programme? What mental health problems did you have and how did you deal with them?
- What was it about Fight4Change's Rollin' with the Punches programme that made you think that it could help your situation, if anything?

Programme Experience

- Generally, how was/is your experience of Rollin' with the Punches?
- Can you describe your involvement on the programme? What activities did you do or specific experiences did you have?
- Of these, which helped you the most and why?
- Of these, which helped you the least and why?

Boxing

- How was boxing used to support your mental health?
- What is it about boxing that you think makes it effective in supporting mental health?

Outcomes

- How has your mental health situation changed following participation in Rollin' with the Punches, if at all?
- How did Rollin' with the Punches contribute to any changes, if at all?

Feedback

- If you could change one thing about Rollin' with the Punches, what would it be and why?

APPENDIX III ADMINISTRATOR INTERVIEW TOPIC GUIDE

17



Recruitment/marketing

- What was done to recruit participants unto the Fight4Change's Rollin' with the Punches programme? (probe for the marketing strategy).
- How do you feel about the process (probe for effectiveness or areas of improvement)?
- What was the referral process unto the Rollin' with the Punches programme like?
- How do you feel about the referral process (probe for effectiveness or areas of improvement)?

Programme delivery

- Generally, how was/is your experience of delivering the Rollin' with the Punches programme (probe for sessions, courses and counselling)?
- Can you describe your involvement on the programme?
- What areas do you think the programme was effective? And areas of improvement?

Impact and Sustainability

- What was the impact of the programme on participants? How was this measured?
- What plans were in place to sustain the improved mental health outcomes of the participants?

Challenges

- What were the challenges experienced on programme delivery (probe for sessions, courses and counselling)?
- What other challenges were experienced on the programme (probe for coaches, gender issues, attrition, session frequency, session content, hygiene practices and innovation)?

Lessons learned

- What were the lessons learned in delivery of the programme?

Feedback

- What would you do differently on the Rollin' with the Punches programme, and why?

Additional Comments

- Any other comment or question?