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# Prison-based Physical Health and Wellbeing Interventions: Evidence review and survey of provision in Scotland's prisons



**HEALTH AND SOCIAL CARE**



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## List of abbreviations

<b>AAA</b>	Animal assisted activities
<b>AAI</b>	Animal assisted interventions
<b>AAT</b>	Animal assisted therapy
<b>GOOP</b>	Greener on the Outside: For Prisons
<b>HMIPS</b>	Her Majesty's Inspectorate of Prisons for Scotland*
<b>NHS</b>	National Health Service
<b>NPrCN</b>	National Prison Care Network
<b>SPS</b>	Scottish Prison Service

<b>Effectiveness classifications key<sup>1</sup></b>	
<b>Effective</b>	Evidence that the intervention is associated with a positive impact on wellbeing, based on a moderate or strong evidence base.
<b>Promising</b>	Findings were positive but not to the extent that they constituted evidence that an intervention was 'effective'.
<b>Mixed</b>	Studies with contrasting results and/or a body of evidence comprised of 'mixed' evidence.
<b>Inconclusive</b>	Insufficient evidence to make a judgement on impact.

\* Please note this research was completed before the death of Her Majesty the Queen.

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<sup>1</sup> See the full list of effectiveness classifications in Annex B.

# Executive Summary

## **Research Aims and Overview**

This report contains a rapid evidence review of prison-based physical health and wellbeing interventions and a survey to identify the scale and scope of these kinds of interventions are currently (or were pre-Covid-19) active across Scotland's prisons. This report was undertaken to support a larger programme research, commissioned by the Scottish Government, to deliver a health and social care needs assessment of Scotland's prison population.

This report focuses on six physical health and wellbeing intervention categories: sports-based; horticultural; yoga, meditation, and mindfulness; art and creative; animal-based; and peer-support. This report is intended to provide information about the effectiveness associated with each of these intervention categories and the extent to which these kinds of interventions are active across Scotland's prisons.

The evidence summarised within this rapid review is predominantly drawn from the UK and the USA. There were few physical health and wellbeing interventions which have been evaluated across Scotland's prisons. The findings from the rapid review and survey have been combined to inform a series of key findings. Conclusions and gaps in the evidence regarding prison-based physical health and wellbeing interventions are also provided.

## **Rapid evidence review**

Given the time constraints for this project, a rapid evidence review was undertaken as opposed to a systematic review. As such, this is an indicative review of the evidence about prison-based physical health and wellbeing interventions and is not intended to be comprehensive. An initial scoping search strategy was undertaken to identify potential prison-based physical health and wellbeing interventions. The following categories were identified: sports-based; horticultural; yoga, meditation, and mindfulness; art and creative; animal-based; and peer-support.

A total of 58 studies were identified as suitable for inclusion. These were individually evaluated based on: the relevance of the evidence; what the evidence says about the effectiveness of the intervention; and the strength of the evidence presented. These pieces of information were used in conjunction with a specific decision-making tool, which had been used in a previous Scottish Government study on [What Works to Prevent Violence Against Women: A Summary of the Evidence](#), to assign an effectiveness rating to each category. The categories used in this report are as follows:

- Effective (Green)
- Promising (Amber)
- Mixed (Amber)
- No effect (Red)
- Negative effect/potentially harmful (Red)

- Inconclusive (Grey)

The decision-making tools were used together to appropriately classify the interventions. The effectiveness of decision-making tree was used to evaluate the evidence for each physical health and wellbeing intervention category as a whole. This led to a classification being provided which were as follows:

- **Effective:** Yoga, meditation, and mindfulness
- **Promising:** Art and creative; Horticultural
- **Mixed:** Animal-based; Sports-based
- **Inconclusive:** Peer-support

### **Primary research**

As a lack of studies identified in the rapid evidence review were conducted in Scotland's prisons, primary research was undertaken to increase knowledge about which physical health and wellbeing interventions are being provided in Scotland's prisons. The survey was developed, with grateful assistance from colleagues in the National Prison Care Network (NPrCN), the Scottish Prison Service (SPS) and an external academic with expertise in prison health research. The survey was shared with relevant prison management and NHS staff across the Scotland's 15 prisons. The survey collected information about:

- What prison and NHS staff perceived to be the emerging or most pressing health needs of Scotland's prison population
- The types of physical health and wellbeing interventions delivered (or were pre-Covid-19) in the prison setting
- The uptake of those interventions by people who live in prison
- The main facilitators and barriers to intervention delivery
- Other interventions prison and NHS staff were aware of in other prisons in Scotland or in the community which they would like to see introduced in their establishment

A total of 12 of Scotland's 15 prisons had prison and/or NHS staff respond to the survey.

According to respondents, the top three emerging or most pressing health needs of Scotland's prison population were: reducing the harmful use of substances, improving mental health and wellbeing and managing the health needs of older people living in prison.

Sports-based and peer-support interventions were the most commonly delivered across Scotland's prisons. Animal-based and horticultural interventions were the least common.

The uptake of physical health and wellbeing interventions by those who live in prison was encouraging for the majority of the intervention categories. There were various

facilitators and barriers to intervention delivery in Scotland's prisons. Staffing, physical resources and engagement with interventions were identified as both facilitators and barriers. Suggestions for future prison-based physical health and wellbeing interventions made by respondents of the survey included:

- "equine therapy"
- "storybook dads"
- "walking groups"

### **Key findings**

It was identified that several different interventions have been evaluated across each category with a variety of outcomes measured. The qualitative evidence reviewed was largely positive regarding the effects of interventions on the physical health and wellbeing of people who live in prison. Quantitative evidence was more mixed with some studies reporting improvements while others reported no change.

Yoga, meditation and mindfulness was classified as an "**effective**" intervention in the rapid evidence review. However, this was only found to be active in 5 of the 12 prisons that responded to the survey. Peer-support interventions were classified as "**inconclusive**" yet were the most common intervention identified.

Improving mental health and wellbeing was identified as one of the emerging health needs of Scotland's prison population according to the results of the survey. This finding may be particularly important given the current Covid-19 pandemic which is expected to have negative consequences for the health and wellbeing of people living in Scotland's prisons. The survey identified that all of the physical health and wellbeing intervention categories included in the evidence review were active across Scotland's prisons to varying degrees. The delivery of these kinds of interventions may have an important role to play in supporting people in prison to recover from the negative effects on mental health and wellbeing which have arisen due to the effects of Covid-19 on their lives of people in prison.

The rapid evidence review identified that a large number of physical health and wellbeing interventions were evaluated in young and adult men. Given that the proportion of older adults living in Scotland's prisons has risen in recent years (Scottish Government, 2020), and the distinct healthcare needs of women in prison, there is potential for considering how interventions could be modified to suit these particular sub-populations. For example, the introduction of walking sports for older adults. Additionally, the identification of other types of interventions by prison and NHS staff that have been delivered in the community suggests that there is scope to expand the current interventions being offered within Scotland's prisons.

Finally, the facilitators and barriers to intervention delivery in Scotland's prisons provided insight as to why some physical health and wellbeing interventions are more active across Scotland's prisons compared to others. For example, some types of interventions, such as animal-based interventions, are more resource intensive when compared to other categories of interventions, such as peer support.

## **Conclusions**

This report highlighted that more evaluative research of prison-based physical health and wellbeing interventions internationally and in Scotland would be beneficial. Few studies used a randomised controlled design, for example, to evaluate an intervention, which is regarded as one of the more robust approaches to determining intervention effectiveness. However, given some of the potential complexities associated with utilising a randomised controlled design within the prison setting, such as the potential additional burden placed on prison resources and logistical difficulties (e.g. following research participants through transfers and post-release) (Kouyoumdjian et al, 2015), the use of contribution analysis and utilising a mix of quantitative and qualitative approaches, when available and appropriate, is encouraged in future research.

It was outwith the scope of this report to identify the costs and cost-effectiveness of delivering prison-based physical health and wellbeing interventions. Research in this area could assist prison and healthcare service staff when making decisions about which kinds of physical health and wellbeing interventions could be delivered to the people who live in their establishment.

The evidence review showed that many of the prison-based physical health and wellbeing interventions were delivered to men, particularly sports-based interventions. Modifying and evaluating these interventions for sub-populations, such as women and older adults, could be beneficial.



# 1. Introduction

This report provides an international evidence review of physical health and wellbeing interventions delivered in prison settings. These interventions were subsequently classified using an established intervention classification tool. A survey was also developed to identify which of the categories of physical health and wellbeing interventions included in this evidence review are (or were pre-Covid-19<sup>2</sup>) available in Scotland's prisons. From this report, future considerations for research were suggested.

## 1.1 Background

At the time of writing this report, 7,562 individuals were in custody in Scotland. Of the total population, 73% were sentenced, 24% were untried and 3% had been convicted and awaiting sentence (SPS data, 24.08.21)<sup>3</sup>. The annual average prison population has fluctuated over the course of the last ten years reflecting the non-static nature of this population. In 2011-12, there was a continuation of a general rising trend in the population. This was then followed by several years of steady reduction. However, between 2017-18 and 2019-20, the average daily prison population rose steeply from around 7,500 in 2017-18 to nearly 8,200 in 2019-20. This rise was found to be amongst adult men only (Scottish Government, 2020).

The majority of people living in prison in Scotland are males aged 21 and over. The average age of individuals being imprisoned has risen from 31.8 years in 2010-11 to 35.9 years in 2019-20, and the proportion of prisoners aged 55 or over has more than doubled in the last decade (Scottish Government, 2020). Between 2000 and 2010, the number of women in prison in Scotland has risen to a daily average of over 400 and has continued around this level for the last decade (Mental Welfare Commission for Scotland, 2021).

It is widely recognised that the health of people entering prison is often poor and disproportionately so when compared to the general population. Examples of poorer levels of health experienced by people in prisons include substance use, mental health and sexual health (Flanigan, 2020; Graham, 2007). Intervening during imprisonment could improve the health of people who experience imprisonment, public health overall, and time spent in prison can be an opportunity to engage people with health services who often do not access them in the community or only do so in an emergency (Shölin et al., 2018). However, prisons can also be detrimental to health with people experiencing a loss of privacy and disconnection from their families (House of Commons, 2018). Efforts to improve the health of people living in prison has implications for public health - due to the high number of people circulating through the prison system, addressing the health of people in prison impacts not only on the individual level, but also at population level through, for example, treatment and prevention of communicable diseases.

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<sup>2</sup> This report takes into account that some interventions were stopped, or their delivery interrupted due to Covid-19 and may not yet have resumed in Scotland's prisons.

<sup>3</sup> It was acknowledged that the prison population had reduced as a result of the early release scheme and a drop in remand numbers due to Covid-19.

The most recent health needs assessment of Scotland's prison population was in 2007 (Graham, 2007), and while many of the same health concerns endure (e.g., high levels of harmful substance use), service provision, data landscapes, and the demographics of the prison population have changed in the years since. The Scottish Government has committed to delivering a refreshed assessment of need of the prison population to reflect these changes and expanded to include social care.

This work is being delivered through 4 sub-projects: social care, mental health, substance, and physical health. The work assessing social care needs, was completed in 2020 with the [report](#) published in January 2021<sup>4</sup>. Each sub-project will feed into a synthesis project which will draw together learning across the programme of research and offer prioritised recommendations.

## 1.2 Aims

The aim of this report is to review the evidence about physical health and wellbeing interventions being offered to people who live in prison by responding to the following questions:

- What categories of physical health and wellbeing interventions have been delivered to people who live in prison?
- How effective are these categories of physical health and wellbeing interventions?
- What physical health and wellbeing interventions are currently being delivered in Scotland's prisons?
- Based on the above, what are the gaps in the literature for prison-based physical health and wellbeing interventions?

## 1.3 Methodology

The research for this report was based on two different methods: a rapid evidence review and primary data collection on physical health and wellbeing interventions being delivered in Scotland's prisons.

A range of search terms were developed for the rapid evidence review, which focussed on interventions being delivered to a prison population in order to improve health and wellbeing<sup>5</sup>. Primary searches were undertaken through the Scottish Government's library databases which included access to Emerald Insight, Science Direct, Cochrane Database of Systematic Reviews, JSTOR journals and British Library eThOs. Grey literature searches were also undertaken<sup>6</sup>. Peer-reviewed

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<sup>4</sup> [Understanding the Social Care Support Needs of Scotland's Prison Population](#)

<sup>5</sup> Search terms included: "intervention", "program\*", "prison\*", "criminal", "offender", "health", "well\*", "art", "creative", "outdoor", "horticultural", "garden", "sport", "physical activity", "yoga", "meditation", "mindfulness", "animal", "dog" and "peer\*".

<sup>6</sup> Grey literature searches were conducted on: UK Ministry of Justice; Her Majesty's Prison and Probation Service publication databases; the Scottish, Welsh, Northern Ireland and Republic of Ireland Government publication databases; National Institute of Justice (USA); Bureau of Justice statistics (USA); Australian Government publications; New Zealand Government publications; Youth Justice; Prison Reform Trust; Centre for Crime and Justice Studies; Penal Reform International; OpenGrey; British library EthOS; ISI Web of Knowledge, and Google Scholar.

academic literature, evaluations of third sector programmes (either independent or self-evaluated) and unpublished theses were identified and included in this evidence review. An international evidence review was decided to include the UK, Ireland, USA, Canada, Australia and New Zealand. These countries were chosen as their justice systems in developed Western countries are much alike in form, structure, and function. Additional inclusion criteria for the evidence review was:

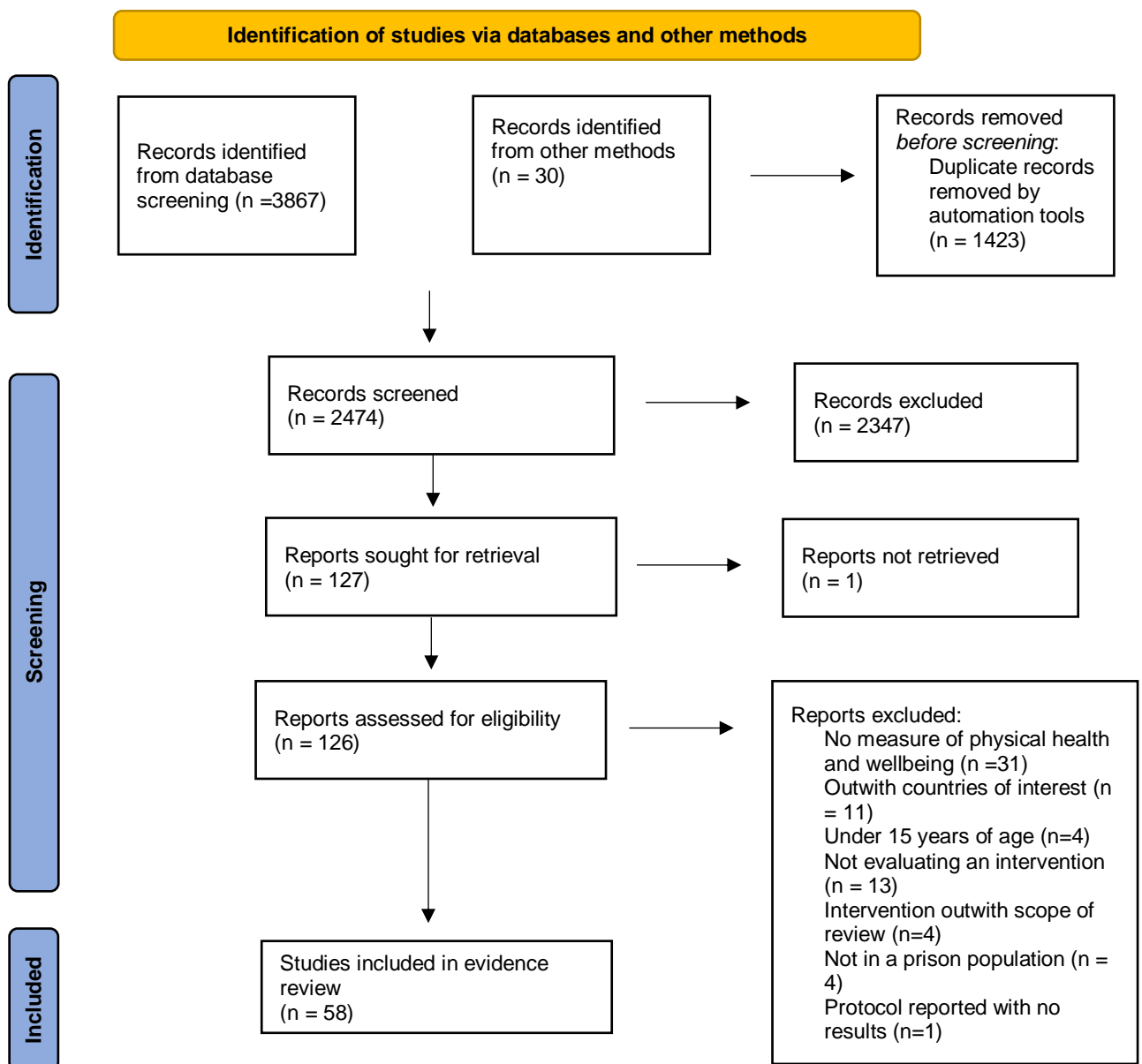
- publication between 2011-2021;
- the intervention was delivered to people who live in prison;
- participants were aged 15+;
- academic literature and reports written in English and with at least one reported health or wellbeing outcome.

Studies were excluded if the intervention was centred on substance use, blood-borne viruses or was therapeutic in relation to mental health (e.g., cognitive behavioural therapy) because the Scottish Government is publishing separate reports on these health needs. This report is based on a rapid evidence review, rather than a systematic review, due to time constraints. As such, this is an indicative review of the evidence and is should be read as comprehensive.

The search strategy was as follows (see Figure 1 below):

- A total of 3,897 records were identified (3,867 from database searches and 30 from other methods).
- Following the automated removal of duplicates (1,423), 2474 records remained and were screened using their title and abstract.
- This screening resulted in 127 articles remaining and sought for retrieval. One record could not be retrieved, leaving 126 records to be assessed for eligibility.
- Of the 126 articles reviewed, a further 68 were excluded based on the following criteria:
  - 31 did not include a measure of health and/or wellbeing;
  - 11 were outwith the countries of interest;
  - 4 included participants under 15 years of age;
  - 13 were not evaluating an intervention;
  - 4 had an intervention outwith the scope of the evidence review;
  - 4 were not in prison populations;
  - and 1 was a protocol with no results reported.
- This resulted in 58 studies for inclusion in the final analysis.

**Figure 1: Flow Chart of Study Selection Process**



To identify what physical health and wellbeing interventions are currently being provided in Scotland’s prisons, a survey was developed with input from colleagues in the NPrCN, the SPS and an external academic with expertise in prison health research. The survey was shared with relevant prison management and NHS staff across Scotland’s 15 prisons. This information was organised and appropriate descriptive analyses were run. The results from the survey were combined with the rapid evidence review to inform Section 5 of this report.

### 1.4 Definitions

Wellbeing has no fixed definition, with many different terms used to describe it (Dodge et al., 2012). One common characteristic across definitions is that wellbeing is the evaluation of one’s quality of life. For the purpose of this report, wellbeing is defined by emotional outcomes (e.g., self-esteem), physical outcomes (e.g., fitness) and social outcomes (e.g., improved relationships).

## 2. Literature on prison-based physical health and wellbeing interventions in prison

### 2.1 Overview of the evidence base

Evidence for the effectiveness of physical health and wellbeing interventions for people who live in prison was encouraging, with positive effects found across a range of interventions. The evidence mainly comprised of articles from the UK, USA, Canada and Australia. A significant proportion of the evaluation literature of wellbeing interventions comes from the UK and USA. Two interventions, Paws for Progress and Inspiring Change, were evaluated in Scotland<sup>7</sup>.

The research evidence included a mix of qualitative, mixed methods, and quantitative studies to evaluate intervention effectiveness. While studies which use a randomised controlled design are regarded as one of the more robust forms of evaluation (Bowes et al., 2014), their application across the evidence was limited. However, using both qualitative and quantitative research provides a more rounded answer about what interventions have worked well in the prison setting. Third sector organisation evaluations and unpublished theses were also identified across various intervention categories.

The literature showed general positive effects, with some studies showing mixed outcomes. The evidence supported the effectiveness of wellbeing interventions in improving emotional outcomes (e.g., reductions stress and anxiety). Many studies which tested interventions incorporating physical activity also demonstrated improvements in physical and health outcomes, including improved cardiovascular fitness and diet. Social outcomes were less commonly reported but positive findings included the development of friendships and social skills. However, the particular mechanisms of interventions which determined the positive impact on health and wellbeing were either not reported or tested robustly in the majority of the literature. Consequently, whether observed improvements in physical health and wellbeing outcomes were the result of someone participating in an intervention should be interpreted with caution. A primary reason for this was that many of the quantitative studies did not include a robust comparison group. However, a reason for this may be due to the well-established complexities of conducting research in prisons, which may have implications for the approaches taken. This is expanded upon in Section 6 of this report.

The literature highlighted that studies evaluating prison-based physical health and wellbeing interventions were predominately delivered to young and adult men. The effectiveness of interventions on the health and wellbeing of women and older adults were less reported. There are specific health challenges identified within these populations, including mental ill-health potentially being more prevalent in women (Bartlett & Hollins, 2018) and poorer physical mobility in older adults (HMIPS, 2017; 2021b). As such, considerations about how to modify certain categories of physical health and wellbeing interventions (e.g., sport-based) to be more age and gender appropriate is an area for intervention development identified in this review.

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<sup>7</sup> All of the studies included in this evidence review are in Annex A.

Overall, the literature review suggested that more evaluation of physical health and wellbeing interventions in Scotland's prisons would be beneficial. As would the development of a more robust evidence base about what interventions might be more effective in prison settings would be beneficial.

There were six categories of prison-based physical health and wellbeing interventions identified for this review based on an initial scoping search of the prison-based literature. These were: (1) sports-based; (2) horticultural; (3) yoga, meditation, and mindfulness; (4) art and creative; (5) animal-based; and (6) peer-support. These categories are similar to those identified across England and Wales, (see Turner et al., 2021). The results of each intervention category identified in the literature search are presented below.

## **2.2 Sports based interventions**

The use of sports-based interventions to improve the health and wellbeing of people living in prison was widely evidenced across the literature. Studies evaluating sports-based interventions ranged from peer-reviewed literature to third sector organisation evaluation reports and unpublished theses (the variety across the strength of the evidence was considered when classifying the effectiveness of the interventions overall).

A systematic review which evaluated the impact of sports-based interventions on the psychological wellbeing of people in prison (Woods et al., 2017) found promising results for sports-based interventions, which covered a range of sports/physical activity (e.g., football, rugby, softball, outdoor sports including sailing and circuit training). In this review, a mix of quantitative and qualitative evidence was evaluated. For quantitative studies, which compared an intervention group to a control group (who did not receive the intervention), positive effects on emotional outcomes included significant decreases in stress, depression and anxiety and significant increases in self-esteem and positive mood were reported. Consistent with this, qualitative results demonstrated that people who live in prison who engaged in sports-based interventions reported an increase in happiness and self-confidence, as well as positive effects on physical health and diet. For diligence, the studies included in the systematic review by Woods et al. (2017) which fulfilled the inclusion criteria for this evidence review were identified and evaluated independently.

Whilst most studies in the systematic review by Woods and colleagues (2017) demonstrated positive effects, a distinction was made between the types of interventions, dependent on the emphasis placed on sport within them (i.e. whether sport was the main activity or was an aspect of a wider programme of activities that made up the intervention). This discussion is similar to a typology developed by Coalter (2007) which distinguished interventions along similar lines. Dependent on the prominence of sport within an intervention, he characterised them as "sports-only", "sports-plus", or "plus sport". These are defined below and were considered in order to identify if a particular category of sports based interventions may have a positive effect on wellbeing

### 2.2.1 Sports-only interventions

In sports-only programmes the majority of the activities involve playing the chosen sport and wider personal or physical development is assumed to be an inherent quality of playing sport (Coalter, 2007). Often these types of schemes utilise sport as a hook to divert at-risk groups towards more positive activities (Hartmann, 2016).

A systematic review of randomised controlled design studies reported mixed findings for the effectiveness of exercise training (i.e., sports-only) interventions on the health of people who live in prison, predominately males (Sanchez-Lastra et al., 2019). The types of exercise training used – which included aerobic exercise interventions (e.g., running), combined exercise interventions (e.g., aerobic plus resistance training) and other interventions (e.g., mixed sports) - was found to have an influence on results. For example, significant improvements in depression and general mental health were found for participants in aerobic exercise intervention groups compared to control groups. However, these positive changes in emotional outcomes were not applicable in combined exercise interventions or interventions which delivered multiple sports (i.e., strength training, golf, Frisbee, hockey, volleyball, football and basketball). Improvements in physical outcomes (e.g., cardiovascular fitness and a lower fat percentage) were reported in aerobic and combined exercise intervention groups compared to control groups.

Rugby focussed sports-only interventions for people living in prison have received empirical attention. One mixed methods study, which was completed as part of a doctoral thesis by Woods (2018), evaluated “Everybody Active 2020”, a six-week rugby coaching programme delivered to young men. Quantitative results showed no significant changes for positive psychological wellbeing in the short or long-term. However, qualitative results demonstrated an improvement in relationships and an increase in positive mood and reduced stress and anger. Another mixed methods study, which also evaluated a rugby training programme for young men, found that participants in the intervention group reported positive health behaviours and a sense of belonging in interviews (Welland et al., 2020). A report evaluating two rugby programmes, “UR Game” for young people and “Walking Rugby” for older adults (55+), also reported a number of positive outcomes, consistent with a number of studies above. These included improvements in confidence, self-esteem, physical fitness and health and developing friendships and trust in others (Ulster Rugby, 2019).

Another sports-only programme identified for inclusion in this evidence review was a mixed methods study which evaluated the use of exercise referral as an intervention for men in prison in Ireland, who experienced mental health symptoms. This intervention involved people being referred to a service (e.g., the prison gym) which formally assessed that person’s needs. A tailored physical activity programme was then developed and the individual’s progress monitored. This intervention used a range of resistance and cardiovascular exercises to meet the needs of participants (O’Toole et al., 2017). Quantitative results found a significant increase in self-esteem alongside a significant decrease in stress, anxiety, depression and anger. These results were mirrored in the qualitative results from participant interviews, with improvements in mood (e.g., reduced stress and anxiety), self-esteem and in physical outcomes (e.g., better sleep, more energy) reported.

### 2.2.2 Sports-plus interventions

In sports-plus programmes sports are either adapted or augmented with additional activities to address wider behaviour or attitudinal aspects, such as workshops on anger management, territoriality, and sectarianism (Coalter, 2007).

Sports-plus programmes included in Woods et al's systematic review (2017) included UK prison-based 'sports academies' (i.e., "2<sup>nd</sup> Chance Sports Academies"). These were prison-based programmes where sport coaching, of football or rugby was used to engage young men in prison under the age of 25 in education and training. Alongside coaching elements, participants had the opportunity to engage in other activities including watching presentations from guest speakers, achieving accredited qualifications, mentoring exercises and goal setting (Meek, 2012). Outcomes from the academies have been reported across multiple publications, showing mixed results. A wide range of benefits were reported qualitatively including improvements in social outcomes, for example, participation in the academies led to participants making friends, which encouraged communication and bonding (Parker et al., 2014), and the development of peer support which continued outwith the academy (Meek & Lewis, 2014b). Improvements in emotional outcomes, such as confidence, self-esteem and feelings of achievement (Parker et al., 2014) and being more able to cope with feelings of anger and stress, as well as positive effects in diet and health, were also reported (Meek & Lewis, 2014b). However, quantitative results reported by Meek (2012) showed no significant improvements in self-esteem immediately after participation in the academies or at a longer follow-up.

A sports-plus rugby programme in the UK, "Get Onside", was also evaluated in young men, aged 18-21, in a single prison (Williams et al., 2015). Similar to the 2<sup>nd</sup> Chance Academies, a range of activities (e.g., goal setting and basic literacy and numeracy) were available to participants alongside playing rugby. Participants had the opportunity to develop their coaching, teaching and officiating skills. Those in the intervention group (who completed the rugby programme) reported a significant improvement in their aggression (e.g., better at controlling their temper), whereas the participants in the control group (who completed questionnaires but were not exposed to the intervention) reported a significant reduction for this outcome (i.e., their capacity to control their aggression got worse). It was found that both the intervention and control group had similar aggression scores at pre-intervention, however, the increase in the aggression score for the control group was not explained. Some possible explanations could include intervention selection biases (i.e., those who were selected to receive the intervention were chosen because they fulfilled specific criteria, such as expressing a desire to change whereas the control group were opportunistically sampled) and the difference between the groups for the nature of their offence (i.e., the majority of the intervention group were in prison for robbery or burglary whereas the majority of the control group were in prison for violence against a person). Positive effects on aggression for the intervention group were mirrored in the qualitative findings, as participants reported feeling calmer, which suggested an enhanced sense of wellbeing. However, no differences between the intervention and control groups were observed on a quantitative measure of self-esteem.



An exploratory case study evaluated an 8-week fitness coach led programme in a prison in the USA (Amtmann & Kukay, 2016). Health and fitness coaching was identified as a relatively new and under-researched area and it differs from personal training in that it allows the individuals to set goals, participate in motivational interviewing and provides education to provide the participant with a wealth of knowledge to improve their physical health and wellbeing (i.e., it utilised the sport-plus format). Personal training, however, focusses on helping individuals exercise only. The group exercise sessions included exercise stations (e.g., sit-ups) and games sessions (e.g., basketball) which were supplemented with a session on goal setting and motivation. Quantitative analyses showed that the participants made improvements in different areas of their physical health with one participant demonstrating improvements in many areas when compared to the other (e.g., weight and cardiovascular fitness). Qualitative evidence demonstrated that the participants were aware of the improvements in their physical appearance and experienced an enhanced sense of wellbeing with reductions in their feelings of stress and anger reported. This study added to the existing minimal information about this type of intervention and a larger study would be beneficial to identify if baseline differences in certain measures (e.g., motivation) explained the differences between participants in the quantitative results (i.e., why did one participant make more improvements compared to the other?).

A mixed methods study which evaluated a programme that delivered workshops to support an in cell workout programme in a male sample in the UK reported positive effects (Baumer, 2018). This intervention involved a mix of exercise (e.g., bodyweight training which can be performed in a cell) and education (e.g., goal setting and nutrition). Consistent with the above sports-plus interventions, improvements were found in physical outcomes (e.g., weight loss) and emotional wellbeing in the short-term. These findings were mirrored in the qualitative results, which reported an increase in mood, feeling less stressed and having more energy.

### 2.2.3 Plus-sports interventions

In plus-sports interventions, sport is used to attract individuals to participate in education or developmental programmes (Coalter, 2007). When reviewing his typology of sport programmes for efficacy, Coalter saw plus-sports programmes as the most promising model as they do not rely on, what he sees as, the one-dimensional notion of the 'power of sport' (Coalter, 2012, p.609) where sport is viewed as possessing inherent developmental qualities and the changes that these kinds of programmes promote more likely to result from the non-sporting components (Coalter, 2012).

A mixed methods study evaluated the effectiveness of the "State of Mind Sports Programme" in men who lived in a UK prison (Woods et al., 2020). Initially developed for community settings (e.g. sports clubs), aspects of the programme were adapted to for use in prisons. This included increasing the amount of content that focussed on suicide and self-harm prevention. State of Mind aimed to raise awareness of and promote wellbeing by providing information about the markers of stress and positive coping strategies through educational sessions. In addition, two case studies were provided by former elite rugby players who experienced poor mental health and had considered taking their own lives. The purpose of these case

studies was to deliver five key messages, which included: “seek help/advice from someone you trust”; “it is a strength, not a weakness to seek help”; “respond to a mate who may be feeling down”; “setting achievable goals and celebrating upon achievement”; and “we are all part of a team”. No significant differences between the intervention and control group on resilience or mental wellbeing outcomes in the quantitative results were reported. However, qualitative findings revealed participants felt a sense of hope and reported positive improvements in their mental wellbeing after engaging with the programme.

#### 2.2.4 Sports-based interventions for women in prison

Most of the sports-based studies in this review have focussed on evaluating sports-based interventions delivered to men in prison, particularly young men. Fewer studies were found which have evaluated sports-based interventions for women in prison. This mirrors the limited attention that has been paid to how physical activity could benefit women in prison (Meek, 2018). There are, however, indications that sports-based interventions might also be beneficial for women living in prison.

An exercise and nutrition intervention delivered to women in prison in Canada reported improvements in physical and emotional outcomes (Martin et al., 2013). Participants were involved in the development of the intervention. Information was collected about their perceptions of fitness, gym equipment use, nutrition and how they understood fitness and health related to other areas (e.g., sleep and stress). This was then used to design the intervention, which offered group circuit classes or individual exercise plans.

At pre-intervention, participants reported objective body measures (e.g., weight). At post-intervention, participants completed a self-report questionnaire about the effects of participating on energy levels, sleep and stress and provided objective body measures. Participants reported improvements in their sleep, energy and stress levels. A decrease in weight and BMI was also observed. Open-ended questions included in the post-intervention also showed that participants reported improvements in their wellbeing, for example improved self-esteem and reduced stress (Martin et al., 2013).

A sports-only intervention delivered to women was identified in an Australian study which evaluated sports programmes across four different prisons (Gallant et al., 2015). The intervention for women was engagement in a bi-weekly softball programme. Improvements in emotional, physical and social outcomes were reported in interviews with participants. These included reduced feelings of stress and anxiety and more engagement in social interactions (Gallant et al., 2015).

In addition, a sports-plus intervention for women who lived in prison in the USA used a pedometer to motivate walking as a form of physical activity, alongside other activities (e.g., education and social support from weekly meetings with a nurse practitioner). An objective measure of weight and height was used to calculate BMI and a self-report questionnaire was used to measure resilience. A significant reduction in BMI and an improvement in resilience, which included perseverance, self-reliance and composure, were reported (Johnson et al., 2018).

### 2.3 Prison horticultural interventions

Prison horticulture themed interventions can encompass a wide range of activities that include a focus on promoting rehabilitation, such as improving physical health and wellbeing, improved teamwork or communication skills (Rutt, 2016). Activities involved in horticultural interventions include the maintenance of gardens/indoor plants/outdoor spaces and growing fruits and vegetables. Consistent with sports-based interventions, evidence ranged from peer-reviewed literature to grey literature which included reports evaluating the effectiveness of horticultural programmes and unpublished theses.

One programme which has received empirical attention in the UK, is “Greener on the Outside: For Prisons” programme (GOOP). This programme aimed to reduce inequalities and achieve sustainable improvements in health, wellbeing and learning outcomes for people living in prison and their families, with a particular focus on mental health, physical activity and healthier eating. Broad programme activities included growing fruit and vegetables, maintaining outdoor space(s) and/or training in horticulture. However, rather than the GOOP model encouraged prisons to tailor their specific approach to the population who live in the prison and the physical capacity of the prison environment. Examples of these different approaches included participants developing a quiet area filled with sensory planting and seating, using polytunnels to grow plants, flowers and vegetables and the provision of horticultural training (Farrier & Kedwards, 2015).

Three evaluations of GOOP have been conducted with positive physical, emotional and social outcomes reported for men and women. For physical health outcomes, quantitative results showed participants reported fewer barriers to engaging in other types of physical activity or that they were now engaging in new physical activity (Farrier & Kedwards, 2015). This was complemented by qualitative results from focus groups and interviews in which participants reported weight loss and feeling fitter (Baybutt et al., 2019; Farrier & Kedwards, 2015). Improvement in diet and nutrition was an additional health benefit identified as a result of engaging in GOOP. Quantitative evidence found that nearly three quarters of participants reported new skills for growing and cooking nutritional food (Farrier & Kedwards, 2015). This was complemented by qualitative evidence in which engagement with the programme encouraged healthier eating (Baybutt et al., 2019). For emotional outcomes, positive mental wellbeing was reported. This included improvements in confidence, self-esteem and anxiety (Baybutt et al., 2019; Farrier et al., 2019; Farrier & Kedwards, 2015). Similarly, improvements in social outcomes, for example better relationships with prison staff and peers, were also reported in quantitative and qualitative evaluations of the intervention (Baybutt et al., 2019; Farrier et al., 2019; Farrier & Kedwards, 2015).

A qualitative study, conducted as part of a doctoral thesis, assessed the role of GOOP in improving the mental wellbeing in men who live in prison (Seymour, 2019). The results closely resembled what was found in the above evaluations, with improvements in confidence, anxiety and stress alongside the development of friendships and improved nutrition via access to fruit and vegetables reported.

An unpublished systematic review by Jenkins (2016) included various horticultural programmes delivered in prisons in the USA. This included the “Master Gardener” programme” which provided horticultural activities and the opportunity for participants to gain qualifications. The evaluation of this intervention was focussed on women who lived in prison. Quantitative evidence showed that participants in the intervention and control group (who participated in other vocational programmes) reported an increase in self-esteem and life satisfaction at post-intervention. As the control group were engaging in alternative programmes, it was perhaps not unsurprising that no differences were observed between the two groups.

Another horticultural programme included in the unpublished systematic review by Jenkins (2016) was called “Greenhouse”. This horticultural programme was a year-round programme involving growing plants for community spaces in the summer, horticultural classes and access to a carpentry shop in the winter. This intervention was delivered to both men and women who live in prison. Qualitative findings showed improvements in wellbeing, which included increases in self-efficacy and self-worth, improvements in happiness, self-esteem and feeling calm, and a reduction in symptoms of depression and anxiety.

The Master Gardener Programme, which sought to assist male substance users with their recovery in prison, was evaluated in a UK prison using a mixed methods approach (Brown et al., 2016). Qualitative evidence, drawn from focus groups and reflective diaries, demonstrated the physical, emotional and social benefits of the programme. Participants reported improvements in health and physical outcomes which included better sleep, diet and fitness. Emotional improvements included an increase in happiness and reduced stress.

A mixed methods pilot study evaluating a horticultural intervention, which invited women who live in prison to prepare plants to tend in their rooms and other small trees and plants for tending in a common area, reported emotional and social benefits (Toews et al., 2018). The women who took part in the intervention reported a positive impact on their relationships with each other and feelings of calm and happiness in focus groups and interviews. The positive emotional impact was mirrored in the quantitative evidence, which was measured using a scale developed by the authors titled the “Interaction with nature scale”. It measured four different emotional states, for example sadness-happiness and anchored the scale ends with emojis. The women were asked to mark along a line on the scale to indicate how they were feeling regarding each emotional state at pre-and post-intervention. These results should be interpreted with caution, however, as the scale used was not a validated, standardised measure and therefore lacks reliability and validity for comparisons with other studies.

The positive emotional impact of a horticultural intervention (i.e., gardening) was also found in an older male sample in a qualitative study in a Canadian prison. Participants reported feelings of calm and pride alongside an improvement in self-esteem and self-worth. Consistent with the nutritional benefits found in the GOOP intervention in the UK, participants reported an improvement in their diet as they had access to the fresh food they grew (Timler et al., 2019).

## 2.4 Yoga, meditation, and mindfulness interventions

Yoga, meditation, and mindfulness are another category of intervention that has been used to try to improve the physical health and wellbeing of prison populations. When searching the literature it was identified that these interventions can overlap (e.g., yoga and meditation) and are sometimes collectively referred to as adjunctive therapies (Auty, Cope, & Liebling, 2017). The use of yoga, meditation, and mindfulness interventions in the prison setting is well-evidenced in the literature as shown by the systematic reviews and meta-analyses which have been conducted to date.

In their meta-analysis, Per et al. (2020) reported a significant reduction in anxiety and depression for individuals who completed a mindfulness intervention (e.g., body scans and sitting meditations) compared to a control group. Positive results were also found in systematic reviews which evaluated the effectiveness of yoga and meditation interventions, when comparing an intervention group to a control group (Auty et al., 2017; Wimberley & Xue, 2016). Wimberley and Xue (2016) reported significant reductions in stress and psychological distress, alongside a significant improvement in positive mood for individuals who completed a yoga intervention compared to those who did not. Similarly, Auty and colleagues (2017) reported that people who live in prison who completed a yoga or meditation intervention experienced a moderate increase in their wellbeing compared to a control group.

It was noted that in the meta-analysis conducted by Per et al (2020), some additional analyses were ran to identify if any particular characteristics (e.g., gender) enhanced the effectiveness of mindfulness interventions. Given the number of studies identified in the meta-analysis, the meta-regression used to identify the possible characteristics was ran on studies which used a pre-post design. It was found that being female, older and engaged in the intervention for longer had positive, albeit weak, effects. The frequency and duration of a yoga or meditation intervention was also considered as a moderator in the meta-analysis conducted by Auty and colleagues (2017). It found that yoga and meditation interventions, which were less frequent but delivered over a longer duration of time, had a larger although not significant effect on wellbeing outcomes compared to shorter more frequent programmes. The benefits of longer and less intensive yoga (with and without meditation) interventions on emotional outcomes for people who live in prison has been supported by individual studies conducted in the UK and Australia as described below.

A ten-week yoga intervention, which involved a standardised set of Hatha yoga poses and stretches, was delivered once a week for two hours to men and women (7% of the sample were women) across several UK prisons. Similar findings to the above systematic reviews were found: participants reported significant improvements in positive mood, perceived stress and psychological distress compared to the control group (Bilderbeck et al., 2013). Subsequent quantitative analyses highlighted that a greater reduction in stress for the intervention group was associated with higher yoga class attendance and engagement with self-practice five or more times a week (Bilderbeck et al., 2015). In addition, engaging in self-practice five or more times a week was significantly associated with a greater reduction in negative mood for the intervention group. It is important to highlight that the parent study of the UK

yoga programme (Bilderbeck et al., 2013) did not report significant reductions in negative mood as a result of the intervention. However, the study which followed reported significant reductions in this outcome (Bilderbeck et al., 2015). A potential reason for this was the different statistical approaches used. In the parent study, the intervention group was compared to a control group, therefore differences between groups were of interest. In the follow-up study only the intervention group was included in the analyses, thus differences within the intervention group were of interest only.

A mixed methods pilot study of an eight-week yoga programme delivered to men in prison in Australia which taught stretches, balances, and meditation, reported mixed results for men who live in prison (Bartels et al., 2019). Although no significant differences were observed between the intervention and control groups, this was arguably expected given the nature of the study (i.e., a pilot study with a small sample size). The quantitative results for the intervention group alone, however, demonstrated statistically significant reductions in depression and stress at post-intervention. In addition, positive affect scores rose while negative affect and anxiety scores reduced. The qualitative analyses produced results which mirrored the quantitative findings, with participants in the intervention group reporting improvements to their physical health (e.g., flexibility, strength and sleep) and wellbeing (e.g., feeling calm and happier).

A qualitative evaluation of yoga delivered to a male sample in a UK prison reported similar findings to the pilot study conducted by Bartels et al. (2019). These included improvements in strength and quality of sleep (Karup, 2016). Additional physical improvements reported were reduced joint and muscle pain and decreases in stress-related physical symptoms, for example headaches. The participants also reported improvements in emotional (e.g., anxiety) and social (e.g., improved relationships inside and outside the prison) outcomes as a result of participating.

Improvements in physical and emotional outcomes have also been reported in an evaluation of a mindfulness programme in the USA that was delivered to men in prison convicted of domestic violence offences. This intervention consisted of sixteen, hour-long group sessions which focussed on using mindfulness meditation techniques, such as thought labelling, to teach participants to identify particular thoughts. Quantitative results reported significant improvements in physical and mental health for the intervention group who completed the mindfulness programme compared to the control group (Tollefson & Phillips, 2015).

In the studies included above, the samples were predominately male, however a small number of studies identified for this review focussed on the effectiveness of yoga, mindfulness, and meditation interventions for women living in prisons in the USA. A ten-week trauma-focussed hatha yoga intervention, which was developed to address the needs of individuals who may be triggered by certain words or commands and to create a safe environment, showed positive results (Danielly & Silverthorne, 2017). Quantitative results demonstrated that women who completed the intervention reported a significant reduction in their stress and depression scores, compared to the control group. While a statistically significant reduction was not found in anxiety scores between the intervention and control groups, a reduction in anxiety scores was observed for the intervention group, which suggests that the

results were moving in the right direction but were not large enough to produce a statistically significant effect (Danielly & Silverthorne, 2017).

A mindfulness meditation intervention which involved women attending eight weekly 2-hour meditation group sessions also reported positive effects. Each session included an instructional and/or philosophical talk, silent mindfulness meditation and walking, yoga and a closing discussion (Williams-McGahee, 2015). Quantitative results showed a reduction in stress and anxiety. These conclusions should be interpreted with caution, however, as the sample size for the study was small ( $n = 6$ ) and results were interpreted for each participant individually rather than for the group as a whole (Williams-McGahee, 2015). It was noted that no studies from the UK which evaluated the effects of yoga, mindfulness and meditations for women living in prison were identified for this evidence review. Given the rapid nature of this review it is acknowledged that there may be literature which was not identified.

## **2.5 Art and Creative interventions**

The use of art and creative-based interventions is another means of improving wellbeing. These interventions can take many forms including music, visual art, writing and drama.

Music-based projects for people in prison have been found to have a positive effect on participant wellbeing. In the UK, “Good Vibrations” is a project which used Gamelan music (orchestra of percussion instruments from Indonesia) as a means of improving wellbeing. Groups of participants work together to learn and play Gamelan music to support the development of their composing and conducting skills. “Good Vibrations” has been found to have positive effects across a range of different prison populations, including women (Caulfield, 2015) and older adults (Wilkinson & Caulfield, 2017).

An evaluation report of “Good Vibrations” reported on the delivery of the programme in a closed prison in the south of England, and the PIPE unit (Psychologically Informed Planned Environment) at one prison in the North of England. PIPEs are specifically designed, contained environments where staff members have additional training to develop an increased psychological understanding of their work. This understanding enables them to create an enhanced safe and supportive environment, which can facilitate the development of those who live there (National Offender Management Service & Department of Health, 2012). Qualitative results found that participants reported an improvement in confidence and emotional benefits, which included feeling more calm and increased happiness alongside a reduction in anger and stress (Caulfield, 2015). A three-month follow-up also recorded improvements in social skills. Participants reported they had been able to make new friendships, continued to speak to people they had met on the project and were more open to talking to different types of people. In their qualitative study, about “Good Vibrations”, Wilkinson and Caulfield (2017) also reported emotional and social benefits in an older male sample. This included the ability to better manage feelings of anger and being able to communicate with others more freely.

“Finding Rhythms” is a music programme which was evaluated using a mixed methods study in a UK prison setting (Kyprianides & Easterbrook, 2020). In this programme, men and women who lived in 13 prisons were invited to work with music professionals to create a music album. Qualitative data was only collected from two prisons. Significant improvements in emotional outcomes (e.g., self-esteem) and overall wellbeing were found in the quantitative results. These improvements in wellbeing were mirrored in the qualitative findings. Participants reported an increase in confidence and emotional benefits (e.g., managing feelings of anxiety and depression). Qualitative findings also showed improvements in relationships amongst participants which facilitated positive social interactions outwith the intervention.

An evaluation of three “Inspiring Change” art interventions delivered to young men in a prison in Scotland included two music-based interventions. “Music for Change” taught participants how to play and record music individually and as a group, with the added option to participate in a final performance. “VoiceMale” provided workshops for song writing, group singing and vocal training, also with a final performance. Qualitative findings showed positive improvements in wellbeing. This included an increase in confidence and self-esteem (Anderson et al., 2011). The third “Inspiring Change” intervention was an arts-therapy intervention which gave participants the opportunity to create a self-portrait based on their own lived experiences. Improvements in confidence and self-esteem were also reported for this intervention (Anderson et al., 2011).

The use of art therapy was incorporated into the “PLAN-A programme”, an intervention which aimed to reduce gang-affiliated violent reoffending amongst young men in a UK prison. While art therapy was one component of this intervention, PLAN-A also included 1:1 mentoring and restorative justice procedures (mediation either directly or indirectly between the individual who lived in prison and the victim of the crime). The art therapy component of PLAN-A was found to have emotional benefits for participants, including the ability to deal with feelings of anger and feeling calmer. Art therapy was also found to benefit participants socially because it provided an opportunity for individuals to have access to positive peer support. Improvements in self-esteem, mental health and wellbeing were reported for the “PLAN-A programme” overall, and it was acknowledged that the art therapy may have contributed to these findings (Meek et al., 2015).

The use of writing as an intervention has been shown to improve wellbeing outcomes for people in prison. A study of a penfriend programme for men living in prison, which involved participants writing and receiving letters from trained volunteers in the community. Outcomes included relief from feelings of isolation, feelings of happiness and improvements in confidence (Hodgson & Horne, 2015). A small mixed-methods pilot study, which evaluated the use of a brief expressive writing intervention to reduce stress amongst women in a prison in the USA, found that writing about a topic of their choice for 20 minutes across five consecutive days was a helpful method for managing emotions with feelings of general relief and reductions in stress reported (Pankey et al., 2016). Quantitative results showed a reduction in stress scores from pre-to post-intervention and while one-month post-intervention stress scores had risen, they did not return to pre-intervention levels. A



possible reason for this increase was that all of the women had been released from prison and had to re-adapt to life in the community at the time of the follow-up.

There are also indications that writing interventions are particularly beneficial for marginalised groups within prison populations. In their study of a creative writing intervention, called “Dreaming Inside”, which was created for Aboriginal and Torres Strait Islander men living in prison in Australia by members of their own community, Hanley and Machetti (2020) found that participants reported emotional benefits. These included the ability to manage emotions, positive feelings of self-esteem and pride in their writing achievements.

The use of performance and drama-based interventions were found to have a positive impact on the wellbeing of women who live in prison. A mixed methods study evaluated a theatre intervention called “Scratching the Surface” which delivered applied theatre techniques, such as role play, in a UK prison. Quantitative results found significant improvements in overall wellbeing alongside a significant reduction in hopelessness. The women selected for this intervention were viewed as vulnerable and at risk of suicide and/or self-harm. As such, the reduction in hopelessness was particularly encouraging as it showed that the women who scored high for suicide risk at pre-intervention were at a reduced risk post-intervention. The qualitative findings from this study supported the improvement in wellbeing with an increase in confidence and self-esteem reported by participants (Stephenson & Watson, 2018).

As well as participating in drama-based interventions, watching drama performances has been found to have a positive effect on wellbeing. A comedy performance intervention which explored mental health issues and encouraged help-seeking behaviour in a UK prison found an improvement in participant’s plans to look after their own mental health. Quantitative results found significant improvements in the ease at which participants felt about approaching various people who worked in the prison setting about their mental health. This included fellow prisoners, prison officers and healthcare staff. Participants also reported an increase in engaging with positive coping behaviours, with 39% of participants saying they planned to start using the gym (Wright et al., 2014).

## **2.6 Animal-based interventions**

The use of animals in the prison setting has been found to improve social and wellbeing outcomes. A variety of animal-based interventions were identified and included in this review.

Dog based training programmes take various forms depending on the needs of the prison population. These types of interventions are found to benefit both animals and humans. A review of prison animal programmes, in which the majority used dogs, included qualitative data which showed positive emotional, physical and social effects for participants. These included feeling less lonely, improved social skills and weight loss (Mulcahy & Mclaughlin, 2013). Few studies in the review included quantitative data for wellbeing outcomes. Of those that did, participants in the intervention group reported a significant improvement in social skills compared to the control group (Mulcahy & Mclaughlin, 2013).

A meta-analysis which evaluated the use of a variety of dog-training programmes across male and female samples identified a small but significant effect for this intervention on emotional outcomes. This included improvements in depression, loneliness, self-efficacy and self-esteem (Cooke & Farrington, 2016). Consistent with these findings, a qualitative study which evaluated the effectiveness of a dog-training programme with a female sample in the USA reported positive improvements in emotional outcomes. In this intervention, women were responsible for training and caring for both service and shelter dogs. The women cared for the dogs either individually or in pairs and lived with the dogs in a small dorm. Improvements in anxiety, self-efficacy and stress were reported (Cooke & Farrington, 2015). Based on the qualitative responses provided by the women, the authors ranked them according to overall improvement. Although the majority of the women who reported improvements had been in prison for over a year and had engaged in the programme for over 6 months, one woman who joined the programme shortly after arriving at the prison was also found to benefit (she was ranked 4<sup>th</sup> out of the 12 participants by the authors). Dog-training programmes therefore may have the potential to help women at various stages of their sentence.

A dog-training programme in the USA, "Healing Species", provided training, socialisation and general care instructions for dogs. A qualitative study which evaluated this programme in two maximum-security male prisons reported improvements in emotional outcomes, such as feeling calmer, improved self-esteem and reduced stress (Smith, 2019).

Another dog-training programme identified was "Paws for Progress", which was delivered to young men in a Scottish prison. This programme taught participants how to train and care for dogs in preparation for them being rehomed. A quantitative evaluation of the programme reported significant improvements in interpersonal and social outcomes (e.g., making friends), for those who completed the intervention. However, no significant improvements in self-esteem were reported (Leonardi, 2016). The positive effect of the intervention on social relationships was mirrored in a qualitative evaluation where participants reported they could better relate to peers after struggling to do so before the programme. Improvements in self-efficacy, mood and managing emotions were also reported (Leonardi et al., 2017).

Animal assisted interventions (AAI) have also received empirical attention in the literature. AAI is an umbrella term which includes animal assisted therapy (AAT) and animal assisted activities (AAA) (Fine et al., 2019). AAT is a structured and individualised therapeutic intervention delivered by a health provider with an animal used as an integral part of the treatment (Villafaina-Domínguez et al., 2020). AAA is a less formal intervention which is not individualised, but aims to provide opportunities for individuals to educate and motivate themselves and enjoy recreational time with the animal (Villafaina-Domínguez et al., 2020).

A systematic review of AAT and AAA interventions reported significant improvements in anxiety and depression for participants in intervention groups compared to control groups. A group AAT, delivered to women in prison, used a combination of psycho-education and therapeutic intervention techniques. In this intervention the dog was used as a proxy to discuss topics. For example, the dogs'

“boundaries” were used as a way of recognising the boundaries of other people. Quantitative results reported no significant improvements in social outcomes (e.g., loneliness or conflict with others) in the intervention group compared to a control group (Jaspersen, 2013). A mixed methods study tested an alternative AAT, the “St. John Ambulance Therapy Dog program” which used dogs in individual therapeutic sessions in a Canadian psychiatric prison. The quantitative results found that across the small sample participants showed a significant improvement in their emotional states (e.g., happiness) at post-intervention. These emotional benefits were mirrored in interviews with the participants (Dell et al., 2019).

An exploratory study within a special unit of a UK prison, which provides intensive care and support, delivered an AAA intervention to three men. This intervention focussed on participants’ interactions with different animals, including dogs, chickens, goats, ducks and miniature ponies which lived in a purpose built animal centre within the unit. The majority of the interactions were with the two dogs in the unit. Qualitative findings showed an improved mood (e.g., feeling happy) and confidence as a result of the animal interaction (Mercer et al., 2015).

While most studies demonstrated the positive effects of dogs in the prison setting, the use of an equine-facilitated learning intervention, which taught young males in a UK prison natural horsemanship skills by teaching a horse games (e.g., asking the horse to move its feet), was also found to improve wellbeing. Based on qualitative findings, participants reported improvements in confidence and feeling calm (Hemingway et al., 2015).

## **2.7 Peer-support interventions**

A systematic review which synthesised evidence on peer-based health and wellbeing interventions in prison settings found positive effects on wellbeing for those who delivered and received the intervention (South et al., 2014). Similar to sports-based interventions, a typology was developed for peer-based interventions which included peer-education and peer-support classifications. Peer education interventions involved an individual living in prison undergoing training and then acting as an educator to communicate information and encourage their fellow peers to engage in healthier and less risky behaviours (South et al., 2014). A large number of these interventions in the literature refer to the prevention of blood-borne viruses and were therefore excluded from this review.

Peer support interventions can involve an individual living in prison providing practical help (e.g., fetching meals), emotional and social support and advice to their peers (South et al., 2014). Examples of peer-support interventions which have reported improvements in wellbeing include the Peer Support Team in Canada and the Listener Scheme in the UK. The Peer Support Team trains women who live in prison to provide one-to-one emotional support to their female peers when it is requested. The Listener scheme selects, trains and support “Listeners” to provide confidential emotional support to their peers who may be experiencing distress. Qualitative findings showed that being a deliverer of these peer-support interventions improved self-esteem (although this was not observed in the quantitative results), self-worth and confidence. In addition, deliverers of a peer-support intervention recognised an increase in their knowledge and associated this with improved social

relationships. They also reported a positive change in their relationship with prisoner staff. However, being a deliverer of the Listener scheme was also found to cause “burnout” and viewed as an emotional burden. For those who received a peer support intervention, particularly those early on in their sentence, reductions in feelings of depression, anxiety and loneliness were reported (South et al., 2014).

A mixed methods study, evaluating the Listener scheme across four UK prisons – and which included male, female and young people living in prison - found that those who received the intervention reported feelings of hope and relief post-intervention. However, feelings of anger and anxiety were also reported (Jaffe, 2012). “Listeners” were also found to benefit from delivering the intervention with improvements in self-esteem and self-worth reported. Furthermore, they reported that engagement in the intervention developed communication skills, which in turn had a positive impact on their personal relationships with staff, friends and family outside of prison.

### 3. Findings - Effectiveness of interventions

Decision-making tools (classification of intervention effectiveness<sup>8</sup> and an evidence of effectiveness decision tree<sup>9</sup>) were used to inform how the evidence was synthesised for this review. These tools were developed for and initially implemented within the Scottish Government report [What Works to Prevent Violence Against Women: A Summary of the Evidence](#). They have been adapted within this report to ensure a consistent and transparent approach to classifying the effectiveness of interventions to promote physical health and wellbeing in the prison population.

The decision tree leads to the following six categories of effectiveness, which have been colour-coded. Annex B provides definitions for each of these evidence classifications and Annex C shows the different paths (i.e., conclusions) which can be made about the evidence included in the review:

- Effective (Green)
- Promising (Amber)
- Mixed (Amber)
- No effect (Red)
- Negative effect/potentially harmful (Red)
- Inconclusive (Grey)<sup>10</sup>

It should be noted that the **inconclusive** category is distinct from the **no effect** category as it indicates either there is insufficient evidence to make a judgement on the impact of an intervention (e.g. only pilot evaluations available) or indicates the need for further research and evidence before conclusions can be drawn on the effectiveness of an intervention.

When using the evidence of effectiveness decision tree the following aspects were considered when classifying the available evidence:

- The relevance of the evidence: must include outcomes related to health or wellbeing
- What the evidence says about the effectiveness of the intervention
- The strength of the available evidence (i.e., was a control group included in the study design?)

When considering the strength of the available evidence the following limitations were identified across the research literature:

- Heterogeneity of interventions

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<sup>8</sup> See Annex B.

<sup>9</sup> See Annex C.

<sup>10</sup> Within this review, the interventions presented do not fall into the 'no effect' or 'negative effect/potentially harmful' categories. However, these have been included here to demonstrate the breadth categories used across decision making tools.

- Heterogeneity of measures used for emotional, physical and social outcomes
- Lack of control/comparison groups
- Small sample size
- Lack of follow-up evaluation
- Selection biases

As a result of the intervention classifications and limitations above, gaps in the literature are included in Section 6 of this report.

The physical health and wellbeing interventions reviewed fell into the effective, promising, mixed or inconclusive categories which are shown in Table 1 below. The examples provided in the table are interventions which have been evaluated in the UK. A brief description has been provided in the table to summarise why each intervention category has been awarded that particular classification.

**Table 1:** Table showing interventions classified by effectiveness

Effective	
Yoga, mindfulness, and meditation interventions (e.g., 10 week Yoga course)	<b>Effective:</b> A number of high-quality evaluations (i.e., strong-moderate evidence which compared an intervention group to a control group) of this intervention category indicated that there were improvements in participants' physical health and wellbeing in the prison population.
Promising	
Horticultural interventions (e.g., Greener on the Outside: For Prisons)	<b>Promising:</b> There was qualitative evidence which reported that horticultural interventions had positive effects on the physical health and wellbeing of the prison population. As there were no quantitative evidence, a conclusion as to whether the interventions were the reason for the positive effects on the physical health and wellbeing of the prison population cannot be made.
Art and creative interventions (e.g., Good Vibrations)	<b>Promising:</b> There was qualitative evidence which reported that art and creative interventions had positive effects on the wellbeing of the prison population. As there were no quantitative evidence, a conclusion as to whether the interventions were the reason for the positive effects on the physical health and wellbeing of the prison population cannot be made.
Mixed	
Animal-based interventions (e.g., Paws for Progress)	<b>Mixed:</b> Qualitative evidence showed positive effects of animal-based interventions on the physical health and wellbeing of the prison population. Quantitative evidence, however, was mixed with some showing positive effects and others no effect.
Sports-based interventions (e.g., 2 <sup>nd</sup> Chance Academies)	<b>Mixed:</b> Qualitative evidence showed positive effects of sports-based interventions on the physical health and wellbeing of the prison population. Quantitative evidence, however, was mixed with some showing positive effects and others no effect.
Inconclusive	
Peer-support interventions (e.g. Listener scheme)	<b>Inconclusive:</b> Limited eligible evidence for the effectiveness of peer-support interventions was found to be included in this review. Consequently, it is not possible to draw reliable conclusions on the effectiveness of these interventions.

## 4. Interventions in Scotland's Prisons – Survey Findings

An initial search of the literature identified a range of prison-based physical health and wellbeing interventions which are being used internationally and smaller amount in the UK. These fell in 6 categories: sport-based, horticultural, yoga, meditation, and mindfulness, art and creative, animal-based and peer-support. The researcher developed a survey to explore the extent to which these interventions are (or were, pre-Covid-19) being delivered in Scotland's prisons. It was developed in consultation with colleagues from the NPrCN, the SPS, and an external academic. The survey was distributed by the NPrCN using MS Forms on behalf of the Scottish Government to identified members of prison management and NHS staff.

The survey (see Annex D) collected information about what prison and NHS staff perceived to be the emerging or most pressing health needs of Scotland's prison population, the types of interventions delivered (or were pre-Covid-19) in Scotland's prisons, the uptake of those interventions by people who live in prison and the main facilitators and barriers to intervention delivery.

Open response questions were used to ask respondents if they were aware of any types of interventions currently being provided within their establishment outwith the categories already identified in the previous evidence review; interventions being offered in other prisons they think would be valuable within their establishment; and interventions being delivered in the community which could be modified and introduced to the prison environment.

A total of 12 of Scotland's 15 prisons (11 public and 1 private) had at least one respondent to the survey. A total of 37 responses were collected from prison management and NHS staff. Of the three prisons which did not respond to the survey, two housed adult males and one housed a mixed adult population.

Whilst this survey aimed to be robust as possible, time constraints restricted the length of time in which data could be collected and there were several considerations which had to be taken into account prior to and when analysing the data. Some of the prisons had a larger number of respondents compared to others. In particular, NHS responses were considerably higher compared to prison management responses. As such, the researcher controlled for multiple responses where necessary (i.e., responses were grouped by prison and role to identify if interventions were delivered in establishments).

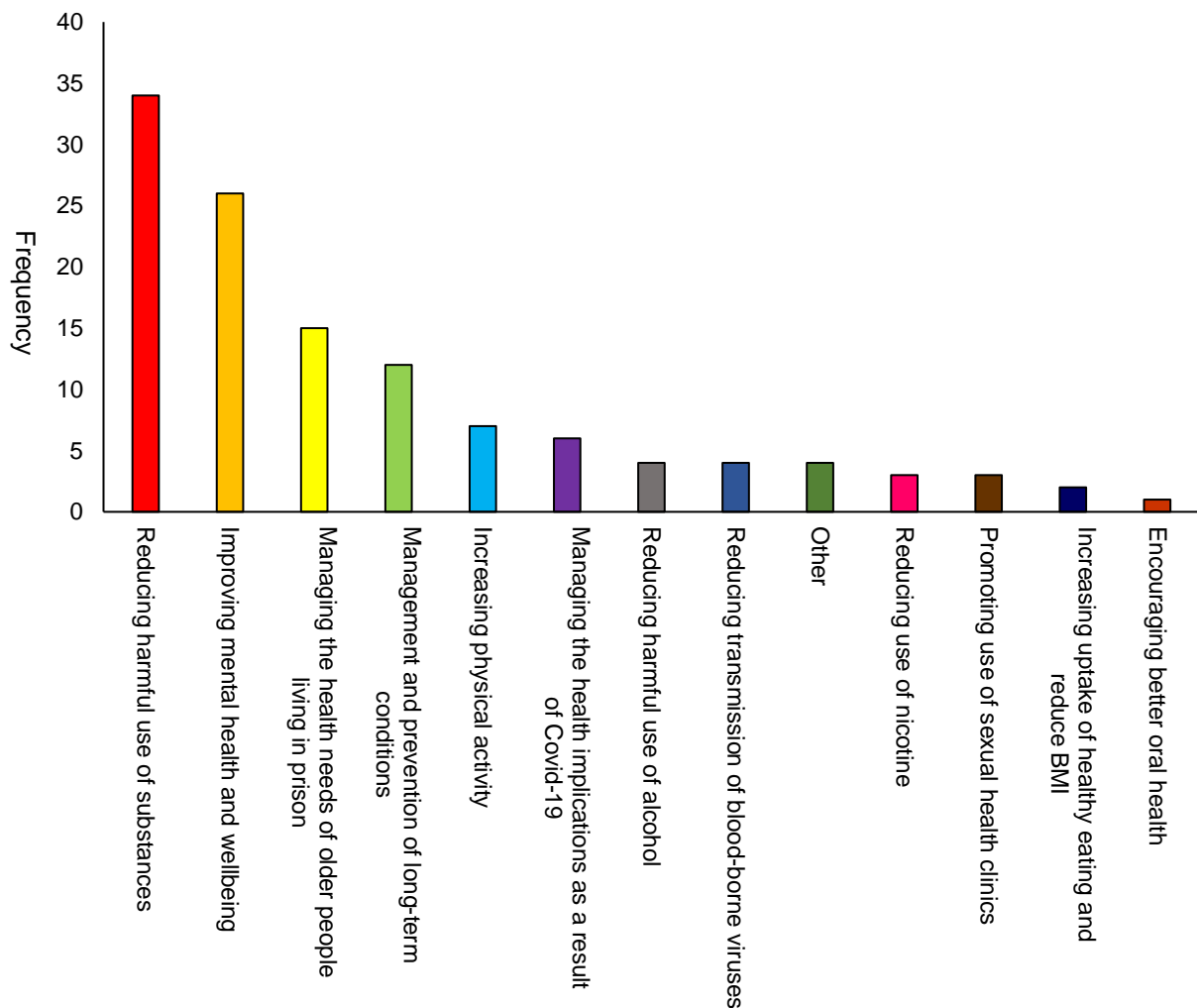
A number of differences emerged in the data such as differences between prison management and NHS staff as to whether or not an intervention category was provided in their establishment. These tensions point to different approaches and engagement with various health interventions across the Scottish prison estate. In addition, some prisons had responses from NHS staff only and it was taken into account that this group may not be fully aware of all of the interventions asked about in this survey, as it is expected that a high proportion of these may be delivered with no health centre involvement. Consequently, the findings of this survey should be viewed as indicative rather than complete.



## 4.1 Health needs of Scotland's prison population

Respondents were first asked “What do you see as the three emerging health needs of the population in your establishment/healthcare centre?” The results found that reducing harmful use of substances, improving mental health and wellbeing and managing the health needs of the ageing population in prison were the three emergent health needs reported for Scotland's prison population. This has been shown in Figure 2 provided below.

**Figure 2:** Frequency of health needs identified as important



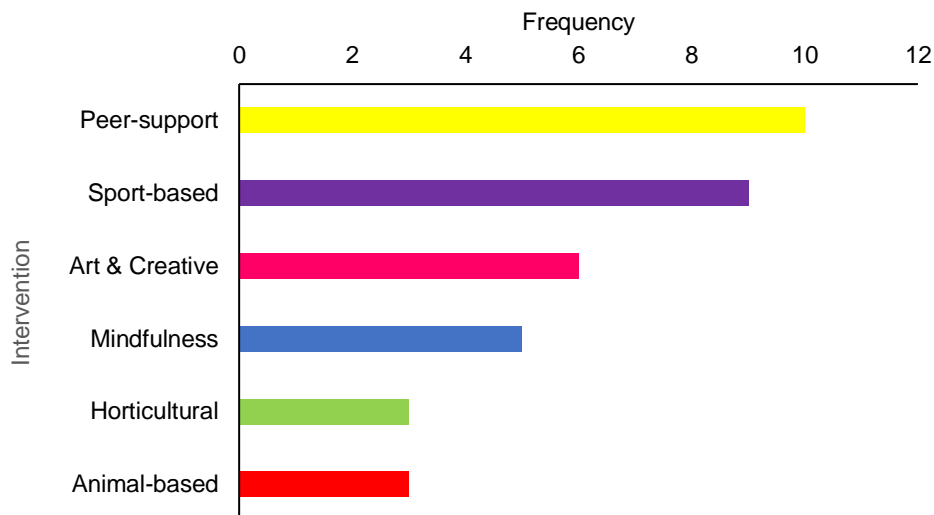
Reducing the harmful use of substances and improving mental health and wellbeing showed a dominance when compared to the other health needs. Given that the sample included prison management and NHS staff, this suggests that staff with different responsibilities and who work across the prison setting are both observing these two health needs most prominently in people who live in Scotland's prisons.

## 4.2 Interventions in Scotland's Prisons

A key aim of the survey was to identify which physical health and wellbeing interventions are currently active (or were pre-Covid-19) in Scotland's prisons.

Respondents were therefore asked “What physical health and wellbeing interventions are currently being provided in your establishment/healthcare centre?”. Animal-based, art and creative, horticultural, mindfulness, peer-support and sports-based interventions are being delivered across Scotland’s prisons to varying degrees (see Figure 3).

**Figure 3:** Frequency of interventions being provided



The interventions which were delivered across the majority of the prisons were peer-support (n=10) and sport-based (n=9). In addition, half of the prisons reported the use of art and creative interventions (n=6). Mindfulness (n = 5), horticultural (n = 3) and animal-based (n=3) interventions were less common across Scotland’s prisons. Given that improving mental health and wellbeing was a key health need identified in the survey, it is encouraging to see interventions which are designed to fulfil this need are active in Scotland’s prisons.

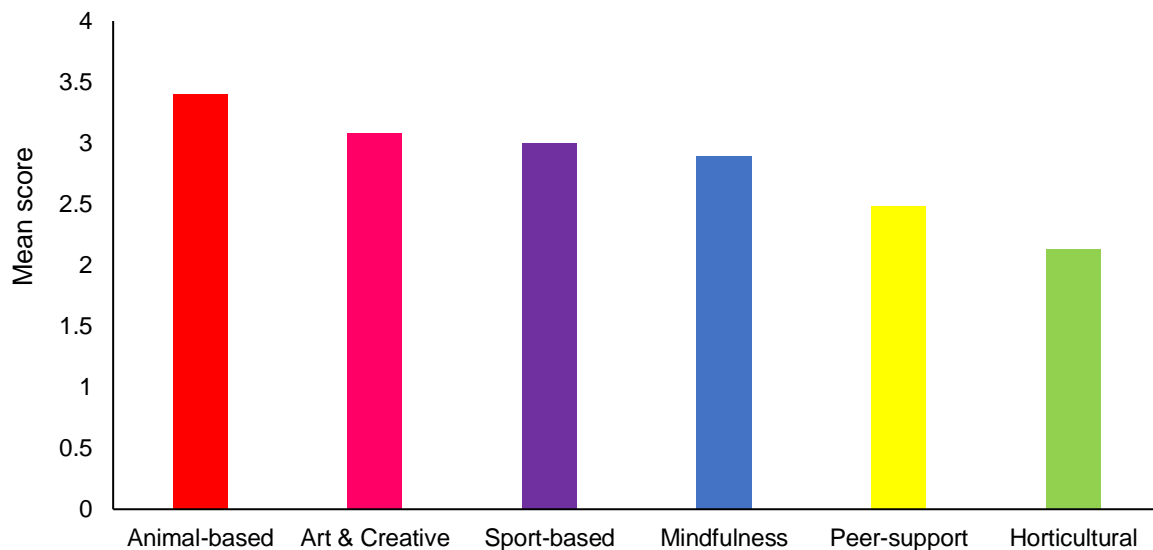
Respondents were additionally asked “Are there any types of physical health and wellbeing interventions missing from the above list that are being provided within your establishment/healthcare centre?” A total of 11 respondents answered yes and provided details. Examples of the types of other interventions being offered in Scotland’s prisons included some which can be classified under the current intervention categories but provide additional detail about the nature of interventions being provided in Scotland’s prisons. Examples included:

- Sport: “outside personal training exercise groups”, “dance” and “general use of the gym”
- Art and creative: “music” and “radio shows”
- Horticultural: “therapeutic garden design”
- Other: “in cell activities including crochet, mental health packs...” “hair and beauty” and “mental health awareness”

### 4.3 Uptake of interventions in Scotland's Prisons

Respondents were asked to assess the uptake of the interventions by those who live in their establishment. They were asked “How would you rate the uptake of these physical health and wellbeing interventions in your establishment/healthcare centre? If the establishment/healthcare centre does not provide an intervention listed, please select N/A”. A 4-point Likert scale was used (1 = poor<sup>11</sup> to 4 = excellent) and a mean score calculated to assess the uptake of each of the identified categories of physical health and wellbeing interventions being delivered in Scotland's prisons. For the majority of interventions, the uptake was encouraging (see Figure 4).

**Figure 4:** Mean rating of interventions being delivered



Across the prisons which have introduced animal-based interventions, the uptake was very good in prisons which house young male and female prison populations ( $M = 3.4$ ,  $SD = 0.84$ ). It was identified that one prison's uptake score for animal-based intervention was lower in comparison to the others.

The uptake of art and creative interventions was good overall ( $M = 3.08$ ,  $SD = 0.85$ ). This was consistent across both male and female (adult and young) prison populations. The main difference in uptake scores was between NHS and prison management with the latter rating the uptake of these interventions more positively.

Mindfulness intervention uptake varied across prisons ( $M = 2.89$ ,  $SD = 0.78$ ). Uptake was rated more positively across adult male and mixed adult prison populations compared to prisons which house young offenders and open prison estates.

Horticultural interventions are currently offered in a small number of prisons in Scotland ( $n=3$ ), with the uptake of them being the lowest of all of the intervention categories ( $M=2.13$ ,  $SD = 1.13$ ). It was identified that there was disparity across prisons, with uptake highest in an adult male prison.

<sup>11</sup> 'Poor' has been used for descriptive purposes only.

For peer-support interventions uptake was adequate ( $M = 2.48$ ,  $SD = 0.92$ ). The majority of prisons reported adequate or good uptake. However, uptake was found to be lower in prisons which house young and adult male prison populations.

Sport intervention uptake across Scotland's prisons was good ( $M = 3.00$ ,  $SD = 0.49$ ). The majority of prisons reported good or excellent uptake.

#### 4.4 Facilitators and barriers to intervention delivery

An area which might extend our understanding of physical health and wellbeing intervention provision in Scotland's prisons was to identify what prison and NHS staff view as facilitators and barriers to intervention delivery. Respondents were asked "What are the facilitators that best support the delivery of these physical health and wellbeing interventions?" and "What are the main barriers that prevent the delivery of physical health and wellbeing interventions?"

The following facilitators were identified by respondents:

- Staffing (75.7%)
- Physical resources (64.9%)
- Participant engagement (56.8%)
- A supportive partnership agreement with a third sector organisation (54.1%)
- A positive relationship between participants and those delivering the intervention (51.4%)

The following barriers were identified by respondents:

- Staffing (75.7%)
- Scheduling (54.1%)
- Physical resources (45.9%)
- Difficulty engaging participants (40.5%)
- Funding (40.5%)

It was recognised that staffing, physical resources and engagement with interventions were identified as both facilitators and barriers. Physical resources were largely seen as a facilitator across the prisons with the exception of three, which were either large capacity prisons and/or were recommended for refurbishment in independent reports. It was also found that across some prisons, NHS staff viewed physical resources as a barrier to intervention delivery, whereas prison management in the same prison viewed physical resources as a facilitator. In regard to staffing and engagement with interventions, many respondents identified this as both a facilitator and barrier within their establishment, which suggests there may be differences across the interventions provided.

#### 4.5 Interventions staff wish to see introduced in their establishment

Respondents were asked "Are there any physical health and wellbeing interventions within other establishments/healthcare centres that you know of that could be valuable within your establishment/healthcare centre?" Approximately 25% of

respondents were aware of physical health and wellbeing interventions in other prisons which they felt would be valuable within the establishment they currently worked in. One intervention, in particular, which was identified across responses was the introduction of animal-based interventions, for example “Paws for Progress” and the “keeping of bees/chickens”. Other interventions respondents wished to see introduced included “walking groups”, “rugby”, “football leagues”, “allotment/gardening”, “yoga”, “mindfulness” and “communication based groups”.

In addition, respondents were asked “Are you aware of any health and wellbeing interventions in the community that you think could be introduced into your establishment/healthcare centre?”. Approximately 30% of respondents felt there were interventions being delivered in the community which they would like to see modified and/or introduced in the establishment they worked in. Among the open-text responses were the following suggestions “nature walks”, “recovery cafes”, “educational packages relating to health, wellbeing and addictions”, “touch rugby”, “local football leagues”, “equine therapy”, “drama therapy” and “storybook dads”.

## **5. Key findings**

### **5.1 What evidence is there on the effectiveness of physical health and wellbeing interventions in the prison setting?**

Evidence from the literature demonstrates the following:

- A number of different interventions have been evaluated within particular categories (e.g., sports-based interventions) and a variety of outcomes were measured.
- Qualitative evidence suggests that prison-based physical health and wellbeing interventions can improve a variety of outcomes (e.g., confidence, diet and relationships) for people living in prison.
- Quantitative evidence was mixed for the effectiveness of physical health and wellbeing interventions for improving emotional outcomes (e.g., anxiety and self-esteem).
- Mixed methods evidence largely showed consistency across both quantitative and qualitative outcomes (e.g., improvements in emotional outcomes). However, some studies (e.g., Woods, 2018) reported contradictory evidence across quantitative and qualitative outcomes.

### **5.2 What are the most effective prison-based physical health and wellbeing interventions?**

- There was strong evidence that yoga, meditation, and mindfulness interventions are effective in improving the health and wellbeing outcomes of people who live in prison.
- There was promising evidence for the use of horticultural and art and creative interventions to improve health and wellbeing outcomes. It was acknowledged that the evidence was consistently positive but only included qualitative evaluations and quantitative evidence without control groups, thus they were not evaluated as effective interventions.
- There was mixed evidence for the effectiveness of sports-based and animal-based interventions improving health and wellbeing outcomes. Mixed results were observed across the quantitative evidence for these interventions, while qualitative results reported positive changes in physical health and wellbeing.
- There was inconclusive evidence for the effectiveness of peer-support interventions. This was of particular interest in the current report as peer-support interventions were one of the more commonly delivered prison-based physical health and wellbeing interventions across prisons in Scotland, according to the results of the survey.

### **5.3 What are the emerging health needs of Scotland's prison population?**

The Covid-19 pandemic has thrown into sharp relief the health needs of people in prison and the relationship between the conditions within prisons and the health of the people who live in them (Armstrong & Pickering, 2020; Prison Reform Trust, 2021). Scotland's prisons went into lockdown in March 2020, which resulted in

drastic changes to the lives of people in custody. Many aspects of prison life which can contribute positively to health and wellbeing (e.g., access to prison gyms and group activities) were paused and the amount of time people spent confined primarily to their cells rose significantly (Maycock, 2021). The negative consequences of this for the health and wellbeing of people living in Scotland's prisons was expected to be significant, thus it was perhaps not surprising that half of people who live in Scotland's prison who participated in the Scottish Lockdown Survey reported their personal wellbeing had worsened (Armstrong, 2020).

One of the emerging health needs identified by prison management and NHS staff in the survey completed for this report was the need to improve the mental health and wellbeing of people living in Scotland's prisons. As this is what some interventions included in the review aimed to enhance, their delivery across the Scottish prison estate will likely have an important role to play in supporting people in prison to recover from the negative effects on mental health and wellbeing which have arisen due to the Covid-19 pandemic (Armstrong & Pickering, 2020; HMIPS, 2021a; Maycock, 2021; Prison Reform Trust, 2021).

Reducing the harmful use of substances was identified as another prominent emerging health need in the Scotland's prison population. This was also a priority identified in Scotland's last National Health Needs Assessment in 2007 (Graham, 2007) and in local, health board level health needs assessments (Flanigan et al., 2021; Gillies et al., 2012).

Managing the health needs of older people living in prison was the third most prominent, emerging health need in Scotland's prison population. It is widely understood that this sub-population has increased health needs – e.g. a higher prevalence of chronic conditions (e.g., coronary heart disease) and dementia (Flanigan, 2020). Given the increase in number of older people living in prison in Scotland (Scottish Government, 2020), it is likely that prisons will need to adapt existing support services, including healthcare, to cater for this needs of this subpopulation. Modifying interventions to improve the physical health and wellbeing in prison could be play an important role in this process.

#### **5.4 What physical health and wellbeing interventions are currently being delivered in Scotland's prisons?**

It was encouraging to see that the six intervention categories included in the evidence review all appeared to be implemented in Scotland's prisons, albeit to varying degrees. Peer-support and sport-based interventions were the most commonly reported.

Given that improving mental health and wellbeing was a key health need identified in the survey, it was encouraging that interventions which are designed to fulfil this need are active across Scotland's prisons, particularly yoga, meditation, and mindfulness. Based on the evidence reviewed, this category of interventions was classified as effective at promoting physical health and wellbeing. It was promising that this category of intervention was also identified by respondents as one they think would be beneficial to people who live in their establishment.

The interventions included in the evidence review were not primarily designed to reduce substance use. However, some of the interventions were found to be beneficial to individuals who were experiencing issues with substance use. For example, a horticultural intervention delivered to males in a UK prison who reported issues with substance use, reported that the outdoor environment supported recovery in the sense that it provided freedom and purposeful activity (Brown et al., 2016).

Specific to the health needs of older people in prison, the use of a variety of interventions across Scotland's prisons is promising, particularly considering how these could be modified to suit this population. For example, a music-based intervention (i.e., Good Vibrations) was delivered to an older UK adult sample and participants reported improvements in managing their emotions and socialisation. This is relevant to older people in prison as this population report feelings of isolation and loneliness (HMIPS, 2017). These types of interventions may also be particularly beneficial to older adults as they offset some of the barriers to their participation in other physical health and wellbeing interventions, such as mobilisation issues limiting physical activity (Wilkinson & Caulfield, 2017).

### **5.5 What does the evidence tell us about facilitators and barriers to intervention delivery in Scotland's prisons?**

While reviewing the research, it was identified that many factors need to be considered in order to effectively deliver an intervention to people who live in prison (e.g., funding to hire third sector organisations). Potential facilitators and barriers to intervention delivery were therefore included in the survey. The main facilitators to intervention delivery, identified by prison management and NHS staff, were physical resources, staffing and participant engagement. Likewise, the main barriers to intervention delivery identified were physical resources, staffing and scheduling. The barriers identified highlight a possible explanation as to why certain interventions were less common across Scotland's prisons compared to others (e.g., animal-based (n=3) compared to peer-support (n=10)). For example, Paws for Progress will require a third sector organisation, prison staff, scheduling and physical resources in order to be successfully delivered. Alternatively Samaritan's Listener scheme relies more on the people who live in prison to deliver this intervention. Peer-support interventions therefore may be less complicated or resource-intensive from a prison management perspective to deliver, as they are more reliant on people who live in prison compared to third sector organisations.

Some NHS staff who work in Scotland's prisons identified physical resources as a barrier to intervention delivery whereas prison management staff viewed them as a facilitator. It is possible that health interventions being delivered in health care centre settings face challenges due to limited physical resources compared to interventions delivered elsewhere within Scotland's prisons (e.g. the prison gym or the prison grounds).

### **5.6 Community interventions**

Interventions being offered in the community which prison management and NHS staff thought would be valuable within their establishment were identified in the



survey. Two of the interventions suggested, equine therapy and drama therapy, were similar to others included in the evidence review. Rather than equine therapy, which refers to a certified professional using a horse to help an individual reach therapeutic goals (Wilkie et al., 2016), an equine facilitated learning intervention which aims to teach individuals social and communication skills, has been delivered to young men who live in a UK prison. This intervention reported improvements in confidence and feelings of calm (Hemingway et al., 2015). For drama therapy, a theatre based intervention which was delivered to a female sample in a UK prison reported significant reductions in feelings of hopelessness and improved confidence and self-esteem (Stephenson & Watson, 2018). In addition, theatre productions have been performed by people living in prison in Scotland, for example Polmont Youth Theatre (Glass Productions, n.d.), therefore there is the possibility to deliver and evaluate drama-based interventions in Scotland's prisons. The suggestion of football leagues is also promising as a means of improving the health and wellbeing of people who live in Scotland's prisons. A prison in Wales has a long established prisoner football team that participates in a football league within the local community (Grundy & Meek, 2021). Participation in the football league allowed individuals to participate in training and matches each week and participants reported improvements physically (e.g., fitness) and emotionally (e.g., relieved tension).

Other interventions based within the community which were suggested by prison management and NHS staff also highlighted interventions which have been developed for sub-populations within the prison population, for example, parents and individuals who engage in harmful substance use. These included "Storybook Dads" and recovery cafes. "Storybook Dads" helps parents record bedtime stories and messages for their children as a means to reconnect families separated through imprisonment (Crawford-Smith et al., 2015). It is also designed to engage the men in other processes relating to literacy, for example practising reading and articulation skills by using different character voices in the story and it also provides the opportunity to talk about parenting skills and positive modelling (Crawford-Smith et al., 2015). Recovery cafes offer a substance free space which encourage people in recovery to meet up with peers and engage in positive activities (SPS, 2018). Given that reducing harmful substance use was identified as an emergent health need in the survey and is a longstanding one in Scotland's prisons, as shown across earlier health needs assessments (Gillies et al., 2012; Graham, 2007), the suggestion of introducing recovery cafes to Scotland's prisons would be an innovative method for addressing this health need.

### **5.7 Intervention modification for women and older adults**

A large proportion of the interventions included in the evidence review were delivered to men who live in prison. However, in Scotland the number of older adults (50+) living in prison have risen in recent years (Scottish Government, 2020). Consequently, being able to modify and tailor physical health and wellbeing interventions to meet the needs of this specific population would appear to be an important area of future focus.

As highlighted previously, older people in prison are more likely to experience mobility issues which would likely limit their ability to participate in some types of interventions, such as sports-based interventions, and particularly those included in

this review which primarily focussed on rugby and football. An example of a modification to sports-based intervention to account for the needs of older adults in prison was the walking rugby intervention, which was a slower, non-contact version of the sport. This was found to be beneficial emotionally and physically to older people living in prison (Ulster Rugby, 2019). Other sports-based interventions that have been modified and introduced in Scotland's prisons to cater for the needs of this older people in prisons include walking football and carpet bowls (HMIPS, 2021b).

A report from HMIPS (2021b) acknowledged that some older adults reported the distance to travel to activities and fear of falling as barriers to engaging in physical health and wellbeing interventions in Scotland's prisons. Tailoring physical activity interventions for this population could include the introduction of personalised gym sessions focussing on mobility and balance, rather than fitness or weightlifting, with the latter often being a key motivation for attending the gym among younger adults in prison (Baumer & Meek, 2018). Modifications which could permit some activities to be done within cells may also benefit health and wellbeing among older people in prisons. For example, modifications to the in-cell workshops programme (Baumer, 2018), such as introducing chair-based workouts to provide less intense exercise routines, could benefit those with more severe mobility issues.

The health needs of women who live in prison are often different from their male counterparts – for example, they often have higher levels of mental health issues and problems with substance use (Prison Reform Trust, 2019). Historically, prison systems, regimes, and services have mostly been developed for men (Penal Reform International, 2008) and a focus on men who live in prison was reflected in the evidence review, with a large number of the sports-based interventions delivered to this population. However, women who live in prison can also benefit from sport and physical activity as it provides them with a distraction from the stress of prison life, thus it provides a coping mechanism, and boosts their self-esteem and well-being (Meek & Lewis, 2014a). A promising intervention in Canada involved women in prison in the development of a fitness and nutrition programme (Martin et al., 2013). By asking participants about their perceptions of physical fitness and their use of gym equipment, group circuit classes and/or individual fitness programmes were developed to meet their needs. Improvements from participating in the programme were reported for physical and emotional outcomes. The non-competitive nature of this intervention contrasts with most of the male sports-based interventions (e.g., football or rugby). It was also acknowledged that the intervention designed for women used solo-based activities whereas the sports-based interventions for men were team based. These differences highlight the importance of modifying sports-based interventions to suit the needs of women as increasing their participation in physical activity has been found to have a positive effect on their health and wellbeing.

## **6. Conclusions and gaps in the literature**

The prison-based health and wellbeing interventions included in this review showed encouraging results. Evidence from the UK and international studies suggests that sport-based; horticultural; yoga, meditation, and mindfulness; art and creative; animal-based and peer-support interventions can improve physical health and

wellbeing (i.e., emotional, physical and social) outcomes for people who live in prison to varying degrees. Based on the evidence review and the results from the survey presented within this report the main conclusions and key gaps in the evidence are listed below under two headings.

## **6.1 Further evaluations of prison-based physical health and wellbeing interventions**

### Conclusions:

The evidence review showed encouraging results for each of the physical health and wellbeing intervention categories included in this report. It is promising that Scotland's prisons deliver these interventions, albeit some are more commonly implemented than others. The intervention effectiveness classification showed yoga, meditation, and mindfulness interventions as an **effective** health and wellbeing intervention. However, these are not being delivered across all of Scotland's prisons. Rather, sports-based and peer-support interventions were the most commonly reported across Scotland's prisons.

The quality of the evidence identified in the evidence review was mixed. When assessing intervention effectiveness, the use of a randomised controlled design which is one of the more robust forms of evaluating interventions was limited. Some studies which utilised a randomised controlled design were identified in the evidence review, particularly for yoga, meditation, and mindfulness interventions, but overall they were limited in number. However, it has been acknowledged that conducting research in a prison setting does not always facilitate the requirements to use a randomised controlled design methodology (e.g., prisoners are transferred/released resulting in sample attrition; Meek, 2012) and there are potential ethical issues regarding the control group not having access to an intervention which would potentially benefit them. When this is the case and given the complex nature of conducting research in prison, an alternative approach researchers could take to evaluate intervention effectiveness in the prison setting is contribution analysis (Mayne, 2011). This approach has been identified as particularly useful when experimental designs are not appropriate and can determine if an intervention contributed to an outcome and in what way, based on verifying solid theories of change (i.e., identifying long-term goals and working backwards from this to identify all of the conditions that must be in place and how these relate to each other in order for the goal to be achieved). The primary value of using contribution analysis in the prison setting is that it offers an approach to reduce uncertainty about whether or not changes in outcomes are a result of the intervention by increasing the understanding of why the results occurred and the roles other factors in the prison had alongside the intervention. This then allows researchers to come to a robust conclusion about the contribution the intervention made to observed results.

### Gaps in the evidence:

Further evaluations of prison-based health and wellbeing interventions in Scotland would improve understanding about which are most beneficial to those who live in Scotland's prisons. For example, while peer-support interventions were delivered in a large number of Scotland's prisons, their effectiveness classification was

**inconclusive** (i.e., there is currently insufficient evidence to make a judgement on impact). Additional evidence would be beneficial to understand the impact these interventions may have on the physical health and wellbeing of people who live in Scotland's prisons. As well as contribution analysis being a possible step forward the following is also recommended within each intervention category when it would be possible to do so:

- Evidence concerning the art and creative and horticultural interventions, which were classified as **promising**, were largely qualitative. Further research which uses a quantitative methodology with a comparison group could allow for more confident conclusions as to whether positive changes in physical health and wellbeing are a result of the intervention or not. This future research is likely to have an important impact on the classification of intervention effectiveness for arts/creative and horticultural interventions.
- Evidence for the animal-based and sports-based health and wellbeing interventions were classified as **mixed**. While the qualitative evidence for these interventions was promising, the quantitative evidence varied across studies. It was also identified that a number of different interventions and assessment tools were used. While having a number of different interventions provides many opportunities for intervention modification, it is difficult to compare across them and identify which components are successfully contributing to improvements in physical health and wellbeing. Using a variety of different assessment tools to assess changes in health and wellbeing also possibly explains why mixed results were observed for certain outcomes (e.g., self-esteem). Replication studies could bring together the current evidence for animal-and sports-based interventions and may positively impact on the classification provided.

Assessments of cost and cost-effectiveness of interventions were not included in the report. This has been identified as a gap in the evidence to be addressed. When further evaluations are undertaken, information about the costs and resources required to deliver prison-based health and wellbeing interventions would be particularly useful. This could provide prison and health service staff with important information about the cost-effectiveness of particular interventions (i.e., which interventions are potentially more cost-effective and meet the needs of the prison population) to support decision making. For example, although equine therapy was named as one of the interventions respondents would like to see introduced in their establishment, it is expected that this will be more costly when compared to other interventions - such as yoga, meditation and mindfulness - and which likely require less resources to deliver.

When considering which kinds of interventions might be appropriate for their prison population, prison and healthcare staff would also likely benefit from having information about differences between the outcomes achieved by intervention categories. For example, some of the interventions teach people a skill which they can practice on their own after the intervention has finished (e.g., yoga) whereas other interventions are centred around group activities (e.g., competitive sport) which an individual cannot practice on their own. Future research considering these

differences may determine if benefits observed as a result of an intervention are maintained in the longer-term in prison.

On a related point, establishing whether an intervention has an impact on people's physical health and wellbeing that is sustained after they leave prison is something future evaluations could consider. While prison is often a time when people can improve their health and wellbeing, such as through more consistent access to medical care or entering treatment programmes (e.g. opiate substitution therapy), the upheaval prison leavers often experience during resettlement can often destabilise progress they have made in prison (Jones & Maynard 2013). Accordingly, it might be more appropriate to deliver interventions which teach an individual skills they can continue to use on their own (e.g., yoga, meditation and mindfulness) closer to their release and other interventions which require group work (e.g., sport-based, animal-based or horticultural) during the main body of their sentence.

## **6.2 Modifying interventions to suit the needs of sub-populations**

### **Conclusions:**

A number of studies included in the evidence review evaluated a physical health and wellbeing intervention that was delivered to young or adult men in prison. This was particularly evident for the sports-based interventions. Evidence for the possible effectiveness of sports-based interventions for women and older adults was limited. The demographics of Scotland's prison population has changed in recent years, with the number of older adults increasing (Scottish Government, 2020). In addition, the results of the survey conducted for this report highlighted that an emerging health need in Scotland's prisons is managing the health needs of the older adult population. While challenging, making modifications to sports-based interventions, which improve the health and wellbeing of women and older adults, could prove a useful addition to services to meet the specific needs of these populations. In addition, given that yoga is potentially less physically demanding and has been identified as an **effective** intervention, it could be beneficial for older adults in Scotland's prisons.

### **Gaps in the evidence:**

Further research exploring how existing sports-based interventions, such as those included in this review, could be modified to cater for the needs of women and older adults, would be beneficial. One way this could be achieved would be to include these sub-populations (i.e., women and older adults) at the design stage of the intervention to identify what their particular needs are. This offers an opportunity for researchers to identify and address the most crucial modifications to pre-existing interventions and/or developing an intervention to suit a particular health and wellbeing need. Gender-responsive interventions have been developed for women who live in prison and have received positive responses (e.g., trauma-informed interventions (Petrillo, 2021)).

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## **8. Annexes**

### **8.1. Annex A: Table of studies included in the evidence review**

Author and DOI/https:	Intervention category	Research methodology and presence of control group	Sample (N, gender, age, prisoner status)	Measures <sup>a</sup>	Results <sup>b</sup>
Woods et al. (2017): <a href="https://doi.org/10.1016/j.mhpa.2017.02.003">https://doi.org/10.1016/j.mhpa.2017.02.003</a>	Sport	Quantitative (n = 9) Qualitative (n = 5) Control groups in 6 studies (4 randomised and 2 non-randomised).	N = 614 Male (n = 527) Female (n = 87) Aged 15 years or over Prisoner status not reported.	Symptom Checklist-90 Revised Positive and negative affect scale Perceived Stress scale	<u>Quantitative</u> Significant improvements in emotional outcomes (e.g., depression and self-esteem) <u>Qualitative</u> Improvements in physical (cardiovascular fitness), emotional (e.g., anxiety) and health and diet outcomes
Woods et al. (2020): <a href="https://doi.org/10.1108/IJPH-10-2019-0057">https://doi.org/10.1108/IJPH-10-2019-0057</a>	Sport	Mixed methods Control group (non-randomised)	N = 75 Male sample Mean age = 37.50 (SD = 11.01) Sentenced	Short Warwick Edinburgh Mental Well-being scale Brief Resilience Scale	<u>Quantitative</u> Non-significant differences between groups on resilience and mental-wellbeing <u>Qualitative</u> Improvements in emotional outcomes (e.g., feeling hope)
Sanchez-Lastra et al. (2019): <a href="https://doi.org/10.1123/jpah.2019-0049">https://doi.org/10.1123/jpah.2019-0049</a>	Sport	Quantitative (N = 11 RCT) Control group (randomised)	N = 697 Gender –majority male Mean age = 24.25 Sentenced	Range of physical outcomes (e.g. VO <sub>2</sub> max) Range of motional outcomes (e.g., Self-esteem inventory)	Significant improvements in physical outcomes (e.g., lower fat percentage), emotional (e.g., depression) for intervention groups compared to control

					No significant differences observed for other emotional outcomes (e.g., self-esteem) between intervention and control groups
Williams et al. (2015): <a href="https://doi.org/10.1108/JCP-05-2014-0008">https://doi.org/10.1108/JCP-05-2014-0008</a>	Sport	Mixed methods Control group present (non-randomised)	N = 24 Male sample Mean age intervention group = 19.55 Mean age control group = 18.77 Sentenced	Self-esteem (single item) Buss-Perry Aggression questionnaire	<u>Quantitative</u> No significant differences between groups for self-esteem Significant decline in aggression for intervention group compared to control group <u>Qualitative</u> Improvements in emotional outcomes (e.g., feeling calm)
Amtmann and Kukay (2016): <a href="https://doi.org/10.1177/1078345815620273">https://doi.org/10.1177/1078345815620273</a>	Sport	Mixed methods	N = 2 Age range: 16-19 Both male Sentenced	Range of measures (e.g., BMI)	<u>Quantitative</u> Improvements in physical outcomes (e.g., cardiovascular fitness) <u>Qualitative</u> Improvements in physical (e.g., cardiovascular fitness) and emotional (e.g., reduced stress) outcomes

Johnson et al. (2018): <a href="https://doi.org/10.1177/1078345818793142">https://doi.org/10.1177/1078345818793142</a>	Sport	Quantitative No control group	N = 29 Female sample Mean age = 42.9 Sentenced	Wagnild and Young Resilience Scale BMI	Statistically significant improvement in BMI
Martin et al. (2013): <a href="https://doi.org/10.1108/IJPH-03-2013-0015">https://doi.org/10.1108/IJPH-03-2013-0015</a>	Sport	Mixed methods No control group	N = 16 Female sample Age range: 18-40+ Sentenced	Physical activity readiness questionnaire Follow-up questionnaire measuring energy, stress and sleep	<u>Quantitative</u> Significant reduction in some physical outcomes (e.g., chest size) <u>Qualitative</u> Improvements in emotional outcomes (e.g., self-esteem)
Baumer (2018): <a href="#">British Library EThOS: Male prisoners' motivation to engage in exercise as a means of promoting physical and mental wellbeing</a>	Sport	Mixed methods No control group	N = 78 N = 36 (2-6 months follow-up) Male sample Mean age = 34.86 On remand, sentenced and in resettlement units	Range of physical measures (e.g., blood pressure) Range of emotional measures (e.g. 1RAND 36 – Item Health Survey)	<u>Quantitative</u> Significant improvements in physical (e.g., weight) and emotional (e.g., emotional wellbeing) outcomes <u>Qualitative</u> Improvements in physical (e.g., fitness) and emotional outcomes (e.g., stress)
Gallant et al (2015): <a href="https://doi.org/10.1016/j.smr.2014.07.005">https://doi.org/10.1016/j.smr.2014.07.005</a>	Sport	Qualitative No control groups	N = 36 (across 4 studies) Male and female samples Age range: 20-60 Prisoner status not reported	N/A	Improvements in physical (e.g., cardiovascular fitness), emotional (e.g., anxiety) and social (e.g., less isolation) outcomes



Welland et al (2020): <a href="https://doi.org/10.12965/jer.1938726.363">https://doi.org/10.12965/jer.1938726.363</a>	Sport	Mixed methods Control group present	N = 46 Male sample Mean age intervention group = 19.64 Mean age control group = 19.76 Sentenced	N/A	<u>Qualitative</u> Improvements in physical (e.g., fitness) and emotional (e.g., sense of belonging) outcomes
Parker et al. (2014): <a href="https://doi.org/10.1080/13676261.2013.830699">https://doi.org/10.1080/13676261.2013.830699</a>	Sport	Qualitative No control group	N = 12 Male sample Aged 15-17 Sentenced	N/A	Improvements in emotional (e.g., self-esteem) and social (e.g., making new friends) outcomes
O'Toole et al. (2017): <a href="https://doi.org/10.1108/IJPH-12-2016-0073">https://doi.org/10.1108/IJPH-12-2016-0073</a>	Sport	Mixed methods No control group	N = 30 Male sample Age range: 22-52 Sentenced	Range of emotional measures (e.g., Depression)	<u>Quantitative</u> Significant improvements in emotional outcomes (e.g., self-esteem) <u>Qualitative</u> Improvements in physical (e.g., sleep), emotional (e.g., self-esteem) outcomes
Meek and Lewis (2014): <a href="https://doi.org/10.1177/0193723512472896">https://doi.org/10.1177/0193723512472896</a>	Sport	Qualitative No control group	N = 79 Male sample Mean age = 19 years and 8 month Sentenced	N/A	Improvements in physical (e.g., diet, emotional (e.g., stress) and social (e.g., peer support) outcomes

Woods (2018): <a href="#">British Library EThOS: The perceived benefits of sport based interventions on the psychological well-being of people in prison</a>	Sport	Mixed methods No control group	N = 14 Male sample Age range: 18-24 Prisoner status not reported.	The Short Warwick Edinburgh Mental Well-being Scale	<u>Quantitative</u> No change in emotional outcomes (e.g., psychological wellbeing) <u>Qualitative</u> Improvements in emotional (e.g., stress) and social (e.g., improved relationships) outcomes
Meek (2012): <a href="#">Meek 2nd Chance Portland Evaluation Final Report.pdf</a>	Sport	Mixed methods No control group	N = 79 Male sample Mean age = 19 years and 8 months Sentenced	Weinberger and Schwartz adjustment inventory (self-esteem) Phillips and Springer's individualised protective factor index	No significant improvement in self-esteem or self-concept Qualitative outcomes reported in Meek and Lewis (2014)
Ulster Rugby (2019): <a href="#">Prison-Evaluation-Apr-2019.pdf</a>	Sport	Mixed methods No control group	(i) N = 35 (ii) N = 20 Gender - NR Age (ii) = 55+ Prisoner status - NR	The Warwick Edinburgh Mental Wellbeing Scale	Improvements in physical (fitness), emotional (self-esteem) and social (e.g., improved relationships) outcomes
Brown et al. (2016): <a href="#">Prison Service Journal: 225   Centre for Crime and Justice Studies</a>	Horticultural	Mixed methods (qualitative reported) No control group	N = 25 (across two phases) Male sample Age - NR Variations in prisoner status	N/A	Improvement in physical (e.g., diet) and emotional (stress) outcomes

Timler et al. (2019): <a href="https://doi.org/10.1080/10509674.2019.1615598">https://doi.org/10.1080/10509674.2019.1615598</a>	Horticultural	Qualitative No control group	N = 10 Male sample Mean age = 52 Sentenced	N/A	Improvements in health (e.g., diet) and emotional (self-esteem) outcomes
Baybutt et al. (2018): <a href="https://doi.org/10.1093/hcapro/day037">https://doi.org/10.1093/hcapro/day037</a>	Horticultural	Qualitative No control group	N = 21 (n = 16 prisoners and n = 5 prison staff) Male and female sample Age - NR Sentenced	N/A	Improvements in health (diet), physical (weight loss) and emotional (e.g., self-esteem) and social (improved relationships) outcomes
Seymour (2019): <a href="#">British Library EThOS: Horticulture, hypermasculinity and mental wellbeing : the connections in a male prison context</a>	Horticultural	Qualitative No control group	N = 51 Male sample Age range 19-60 On remand or sentenced	N/A	Improvements in health (e.g., nutrition), emotional (e.g., anxiety) and social (e.g., development of friendships) outcomes
Toews et al. (2018): <a href="https://doi.org/10.1108/IJPH-12-2017-0065">https://doi.org/10.1108/IJPH-12-2017-0065</a>	Horticultural	Mixed methods No control group	N = 11 Female sample Age - NR Prisoner status not reported	'Interaction with nature scale' (visual analog tool developed for purpose of study)	<u>Quantitative</u> Improvements in emotional outcomes (e.g., feeling more happy) <u>Qualitative</u> Improvements in emotional (e.g., feeling calmer) and social (e.g., improved relationships) outcomes

<p>Farrier and Kedwards (2015): <a href="#">E_Impact Report - Greener on the Outside For Prisons (2015).pdf (uclan.ac.uk)</a></p>	<p>Horticultural</p>	<p>Mixed methods No control group.</p>	<p>N = 872 Male and female sample Age – NR</p>	<p>NR</p>	<p><u>Quantitative</u> Improvements in health, (e.g., healthy eating), emotional (e.g., confidence) and social (e.g., social interactions) outcomes <u>Qualitative</u> Improvements in physical, (e.g., weight loss), emotional (e.g., confidence) and social (e.g., improved relationships) outcomes</p>
<p>Jenkins (2016): <a href="#">"Landscaping in Lockup: The Effects of Gardening Programs on Prison Inmates" by Rachel Jenkins</a></p>	<p>Horticultural</p>	<p>Quantitative and qualitative studies included.</p>	<p>Studies included male and female Age and prisoner status not reported</p>	<p>The Rosenberg Self-Esteem Scale The Satisfaction with Life Scale</p>	<p><u>Quantitative</u> Improvement in emotional outcomes (e.g., self-esteem) for both intervention and control participants. <u>Qualitative</u> Improvements in emotional outcomes (e.g., anxiety)</p>
<p>Farrier et al. (2019): <a href="https://doi.org/10.1108/IJPH-11-2017-0055">https://doi.org/10.1108/IJPH-11-2017-0055</a></p>	<p>Horticultural</p>	<p>Mixed methods No control group</p>	<p>N = 137 Male and female Age range: 18-65</p>	<p>Green Gym questionnaires Warwick Edinburgh Mental Wellbeing Scale</p>	<p><u>Quantitative</u> Improvement in emotional (e.g., confidence) and social (e.g., making new friends) outcomes <u>Qualitative</u> Improvements in emotional (e.g., confidence) and social</p>

					(e.g., increased social interactions) outcomes
Bartels et al. (2019): <a href="https://doi.org/10.1177/0306624X19854869">https://doi.org/10.1177/0306624X19854869</a>	Yoga, meditation, and mindfulness	Mixed methods No control group	N = 8 Male Age range: 18-49 Prisoner status not reported	Depression, anxiety and stress scale Positive and negative affect scale Difficulties with emotion regulation scale Rosenberg self-esteem scale	<u>Quantitative</u> Significant improvements in emotional outcomes (e.g., stress) No significant changes in other measures (e.g., anxiety) <u>Qualitative</u> Improvements in physical (e.g., strength) and emotional (e.g., feeling calm) outcomes
Tollefson and Phillips (2015): <a href="https://doi.org/10.1007/s10896-015-9715-9">https://doi.org/10.1007/s10896-015-9715-9</a>	Yoga, meditation, and mindfulness	Quantitative Control group (randomised)	N = 90 Male Mean age = 33.5 Prisoner status not reported	SF-36 Health Survey	Significant improvements in physical and emotional outcomes for intervention group compared to control group.
Auty et al. (2017): <a href="https://doi.org/10.1177/0306624X15602514">https://doi.org/10.1177/0306624X15602514</a>	Yoga, meditation, and mindfulness	Quantitative (in meta-analysis) Control group present in studies included in meta-analysis	N = 75 Male and female Age range: 18-66 Prisoner status not reported	Range of measures (e.g., Hamilton Anxiety Rating Scale)	<u>Quantitative</u> Significant improvement in emotional (e.g., anxiety) outcomes for the intervention group compared to the control group.

Wimberly and Xue (2016): <a href="#">A Systematic Review of Yoga Interventions in the Incarcerated Setting</a>	Yoga, meditation, and mindfulness	Quantitative (n = 9) Qualitative (n = 1) 3 studies included a control group	Not reported	Range of measures (e.g., The Rosenberg Self-Esteem Scale)	<u>Quantitative</u> Significant improvements in emotional outcomes (e.g., anxiety) for intervention group compared to control group <u>Qualitative</u> Improvements in emotional outcomes (e.g., managing stress)
Per et al. (2020): <a href="https://doi.org/10.1177/093854819891457">https://doi.org/10.1177/093854819891457</a>	Yoga, meditation, and mindfulness	Quantitative 8 studies included a control group	N = 2,265 75% male Studies of incarcerated adults (n = 11); mean age = 36.65 Prisoner status not reported	Range of measures (e.g., Beck Anxiety Inventory – II)	Significant improvements in emotional outcomes (e.g., anxiety) for intervention group compared to control group
Williams-McGahee (2015): <a href="#">OpenAccess Mindfulness meditation for stress and anxiety</a>	Yoga, meditation, and mindfulness	Quantitative No control group	N = 6 Female Aged range: 23-55 Prisoner status not reported	Perceived Stress Scale – 10 Beck Anxiety Inventory	Improvements in emotional outcomes (e.g., stress)
Bilderbeck et al. (2013): <a href="https://doi.org/10.1016/j.psychires.2013.06.014">https://doi.org/10.1016/j.psychires.2013.06.014</a>	Yoga, meditation, and mindfulness	Quantitative Control group (randomised)	N = 100 Intervention: 95.5% male Mean age = 37.38 Control: 90.9% male Mean age = 39.42 Prisoner status not reported	Barrett Impulsiveness Scale Positive and Negative Affect Scale Perceived Stress Scale Brief Symptom Inventory	Significant improvement in emotional outcomes (e.g., stress) in intervention group compared to control group.

Bilderbeck et al. (2015): <a href="https://doi.org/10.1155/2015/819183">https://doi.org/10.1155/2015/819183</a>	Yoga, meditation, and mindfulness	Quantitative No control group included in analyses	N = 55 Intervention: 95.5% male Mean age = 37.38 Prisoner status not reported	Barrett Impulsiveness Scale Positive and Negative Affect Scale Perceived Stress Scale Brief Symptom Inventory	Improvements in emotional outcomes (e.g., stress)
Danielly and Silverthorne (2017): <a href="https://doi.org/10.17761/1531-2054-27.1.9">https://doi.org/10.17761/1531-2054-27.1.9</a>	Yoga, meditation, and mindfulness	Quantitative Control group (randomised)	N = 50 Female Mean age = 37.92 Sentenced	Perceived Stress Scale Depression, Anxiety and Stress Scale	Significant improvement in emotional outcomes (e.g., stress) for the intervention group compared to the control group.
Nidich et al. (2016): <a href="https://doi.org/10.7812/TPP/16-007">https://doi.org/10.7812/TPP/16-007</a>	Yoga, meditation, and mindfulness	Quantitative Control group (randomised)	N = 181 Male Intervention group mean age = 28.60 Control group mean age = 29.95 Sentenced	Trauma symptom checklist Perceived Stress Scale	Significant improvement in emotional (e.g., depression) and physical outcomes (e.g., sleep disturbance) in the intervention group compared to the control group
Karup (2016): <a href="#">Azra-Karup-Dissertation-Yoga-in-Prison-2016.pdf</a>	Yoga, meditation, and mindfulness	Qualitative No control group	N = 11 Male Mean age = 55	N/A	Improvements in physical outcomes (e.g., strength), emotional (e.g., anxiety), and social (improvements in relationships) outcomes
Hanley and Marchetti (2020): <a href="https://doi.org/10.1177/004865820905894">https://doi.org/10.1177/004865820905894</a>	Art and creative	Mixed methods No control group	N = 96 (study 1) N = 30 (study 2) Male Age range 20-50 Prisoner status not reported	NR	<u>Qualitative</u> Improvements in emotional outcomes (e.g., self-esteem)

Wright et al. (2014): <a href="https://doi.org/10.3109/09540261.2014.924096">https://doi.org/10.3109/09540261.2014.924096</a>	Art and creative	Quantitative No control group	N = 70 (pre-intervention; n = 24 post-intervention) Female Mean age = 32.6 Sentenced	Mental Health Knowledge Schedule	Significant improvement in knowledge about mental health problems Significant change in social outcomes (e.g., comfort in talking to various people) Post-performance positive engagement in help-seeking and coping behaviours (e.g., start using gym was a 39% increase).
Meek et al. (2015): <a href="#">Belong evaluation Mee k_et_al.pdf</a>	Art and creative	Mixed methods No control group	N = 47 Male Mean age = 22 Sentenced	N/A	Improvement in emotional outcomes (e.g., self-esteem) Provision of peer-support in art therapy was viewed positively by prisoners
Caulfield (2015): <a href="#">Good vibrations projects with vulnerable and challenging women final.pdf</a>	Art and creative	Qualitative No control group	N = 26 Female sample Mean age = 30 Sentenced	N/A	Improvements in emotional (e.g., confidence) and social (e.g., (social skills)) outcomes
Hodgson and Horne (2015): <a href="https://doi.org/10.2139/ssrn.2607575">https://doi.org/10.2139/ssrn.2607575</a>	Art and creative	Mixed methods (prisoner information was quantitative) No control group	N = 113 Male Age range: 20-70+ Sentenced	N/A	Improvements in emotional outcomes (e.g., happiness)



Stephenson and Watson (2018): <a href="#">Prison Service Journal 239</a>	Art and creative	Mixed methods No control group	N = 21 Female sample Mean age = 31 Prisoner status not reported	Warwick Edinburgh Mental Well-being Scale Beck Hopelessness Scale	<u>Quantitative</u> Significant improvements in reduction in hopelessness and overall wellbeing <u>Qualitative</u> Improvements in emotional outcomes (e.g., confidence and self-esteem).
Pankey et al. (2016): <a href="https://doi.org/10.1177/1078345816654230">https://doi.org/10.1177/1078345816654230</a>	Art and creative	Mixed methods No control group	N = 6 Female sample Mean age = 40 Sentenced	Perceived stress scale	<u>Quantitative</u> Improvement in emotional outcomes (e.g., stress) <u>Qualitative</u> Improvement in emotional outcomes (e.g., feeling relief)
Wilkinson and Caulfield (2017): <a href="https://doi.org/10.5964/ejop.v13i1.1207">https://doi.org/10.5964/ejop.v13i1.1207</a>	Art and creative	Qualitative No control group	N = 13 Male sample Age range: 50-65 Sentenced	N/A	Improvement in emotional (e.g., anger) and social (e.g., being able to talk to others) outcomes
Anderson et al. (2011): <a href="#">Prison Service Journal: 197   Centre for Crime and Justice Studies</a>	Art and creative	Qualitative No control group	N = 16 to 25 Male sample Age not reported Prisoner status not reported	N/A	Improvement in emotional outcomes (e.g., self-esteem)

Leonardi et al. (2017): <a href="https://doi.org/10.3390/ijerph14080945">https://doi.org/10.3390/ijerph14080945</a>	Animal	Mixed methods – qualitative reported No control group	N = 70 Male sample Age range: 16-21 Sentenced	N/A	Improvements in emotional (e.g., self- efficacy ) and social (e.g., working together) improvements
Smith (2019): <a href="https://doi.org/10.1080/10509674.2019.1596189">https://doi.org/10.1080/10509674.2019.1596189</a>	Animal	Qualitative No control group	N = 285 Male sample Age not reported Prisoner status not reported	N/A	Improvements in emotional outcomes (e.g., self-esteem)
Jaspersen (2013): <a href="https://doi.org/10.2752/175303713X13534238631678">https://doi.org/10.2752/175303713X13534238631678</a>	Animal	Quantitative Control group present	N = 74 Female sample Mean age = 3 Sentenced	Outcome Questionnaire	No significant differences between groups for improvements in symptom distress and interpersonal relationships
Hemingway et al. (2015): <a href="https://doi.org/10.1163/15685306-12341382">https://doi.org/10.1163/15685306-12341382</a>	Animal	Qualitative No control group	N = 20 Male sample Aged 18-21 Prisoner status not reported	N/A	Improvements in emotional outcomes (e.g., confidence)
Dell et al. (2019): <a href="https://doi.org/10.1108/IJPH-04-2018-0020">https://doi.org/10.1108/IJPH-04-2018-0020</a>	Animal	Mixed methods No control group	N = 3 Male and female sample Mean age = 48 Sentenced	NR	<u>Quantitative</u> Significant improvement in mental wellbeing (e.g., feeling happy) <u>Qualitative</u> Improvements in emotional outcomes (e.g., less stress)

<p>Villafaina-Dominguez et al. (2020):  <a href="https://doi.org/10.3390/ani10112129">https://doi.org/10.3390/ani10112129</a></p>	<p>Animal</p>	<p>Quantitative (n=12)  Qualitative (n= 8)  Control group present (n=6)</p>	<p>N = 1295  Male and female  Aged 16-69</p>	<p>Range of measures (e.g., Rosenberg Self-esteem scale)</p>	<p><u>Quantitative</u>  Significant differences between intervention and control groups on emotional outcomes (e.g., depression)  Significant differences between males and females on emotional outcomes (e.g., anxious, happy)  <u>Qualitative</u>  Improvements in physical (e.g., weight loss), emotional (e.g., anxiety), social (e.g., ability to meet people) outcomes</p>
<p>Mulcahy and McLaughlin (2013):  <a href="https://doi.org/10.1111/a.p.12021">https://doi.org/10.1111/a.p.12021</a></p>	<p>Animal</p>	<p>Quantitative (n = 5)  Qualitative (n = 3)  Mixed methods (n = 3)  Control group present (n=4)</p>	<p>N = 412  Male and female  Age not reported  Prisoner status not reported</p>	<p>NR</p>	<p><u>Quantitative</u>  No significant difference between intervention and control group on social skills  <u>Qualitative</u>  Improvements in physical (e.g., weight loss), emotional (e.g., loneliness) and social (e.g., social skills)</p>
<p>Leonardi (2016): <a href="#">British Library EThOS: Paws for Progress : the development and evaluation of the first prison based dog</a></p>	<p>Animal</p>	<p>Quantitative  Control groups present</p>	<p>N = 58  Male sample  Aged 16-21  Sentenced</p>	<p>BarOn Emotional Quotient Inventory: Short Rosenberg Self-Esteem Scale  Assessment of Needs</p>	<p>Significant improvement in social outcomes (e.g., establishing relationships) for intervention group</p>

<a href="#">training programme in the UK</a>					Significant improvement in stress management for control group No significant improvement in self-esteem for intervention group
Cooke and Farrington (2015): <a href="https://doi.org/10.1080/08974454.2014.909763">https://doi.org/10.1080/08974454.2014.909763</a>	Animal	Qualitative No control group	N = 12 Female sample Mean age = 38.36 Sentenced	N/A	Improvements in emotional outcomes (e.g., stress)
Cooke and Farrington (2016): <a href="https://doi.org/10.1177/032885516671919">https://doi.org/10.1177/032885516671919</a>	Animal	Quantitative (n = 10) Control group present (n = 7)	N = 310 program participants and N = 514 control participants Male and female Age not reported Prisoner status not reported	Range of measures (e.g., Coopersmith Self-Esteem Inventory)	Significant but relatively small effect across all internalising outcomes (i.e., self-esteem, depression, loneliness, self-efficacy and wellbeing)
Mercer et al. (2015): <a href="https://doi.org/10.1108/JFP-09-2014-0031">https://doi.org/10.1108/JFP-09-2014-0031</a>	Animal	Qualitative No control group	N = 3 Male sample Age not reported Prisoner status not reported	N/A	Improvement in emotional outcomes (e.g., feeling calmer)
South et al. (2014): <a href="https://doi.org/10.3310/hdr02350">https://doi.org/10.3310/hdr02350</a>	Peer	Quantitative (n = 19) Qualitative (n = 16) Mixed methods (n = 17) Unclear (n = 5) Control group - NR	Participant details not reported.	Rosenberg self-esteem scale	<u>Quantitative</u> No significant differences between the intervention and control group for self-esteem Listeners reported positive differences in relationships with prison staff

					Qualitative Improved emotional outcomes (e.g., anxiety)
Jaffe (2012): <a href="#">British Library EThOS: Peer support and seeking help in prison : a study of the Listener scheme in four prisons in England (bl.uk)</a>	Peer	Mixed methods No control group	N = 331 Male and female Age range: 18-31+ Sentenced (70.1%) and un-sentenced (28.4%)	Warwick-Edinburgh Mental Well-being scale Liebing's (2004) scales – prisoner social life, staff-prisoner relationships	Participants reported mixed emotional outcomes (e.g., relief, anger and anxiety) Listeners reported improvements in emotional (e.g. self-esteem) and social outcomes (e.g., improved communication skills)

<sup>a</sup> Only health and wellbeing outcomes from the studies were included

<sup>b</sup> Differences between groups were reported rather than intragroup differences where provided

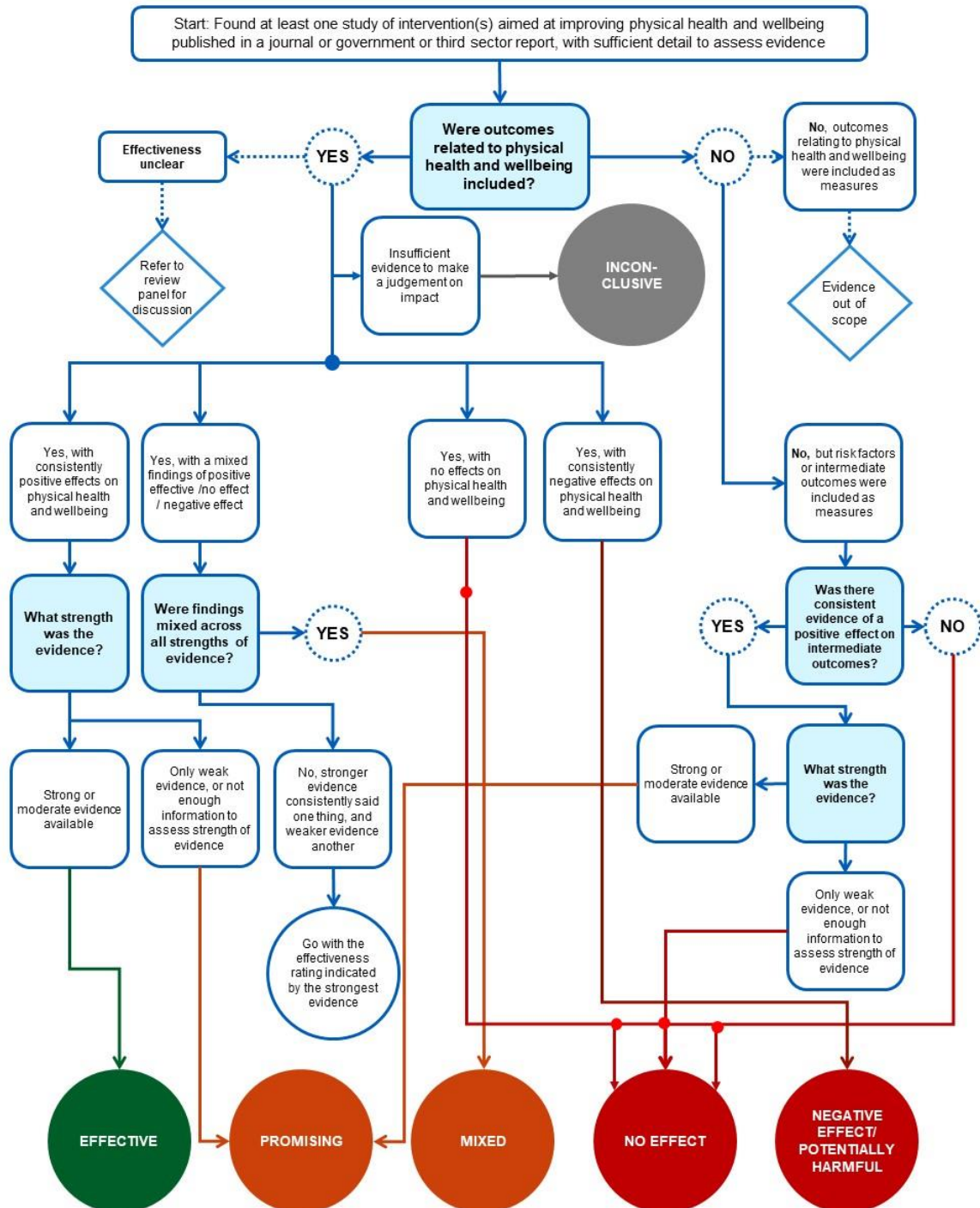
## 8.2. Annex B: Classification of intervention effectiveness

Drawing on definitions and terminologies used by [NICE](#) and [DFiD](#), a comprehensive classification system has been developed to categorise the effectiveness of interventions based on available evidence. The decision making tool below has been used to determine effectiveness ratings throughout this report on what works to promote health and wellbeing among prison populations. It has been used alongside a purposively designed decision tree presented in Annex C.

Category	Definition
<b>Effective</b>	Evidence that the intervention is associated with a positive impact on health and wellbeing, based on a moderate or strong evidence base. Due to the complexity of causality, an 'effective' intervention should be considered one that contributed towards improved health or wellbeing rather than one that single-handedly accounts for an increase in health or wellbeing.
<b>Promising</b>	Findings were positive but not to the extent that they constituted evidence that an intervention was 'effective', this could be: (i) in cases where an intervention has a positive impact on an intermediate outcome, rather than in improving health and wellbeing itself (ii) where authors noted a positive change, but expressed doubts as to whether the intervention could confidently be said to have contributed to this (e.g. due to evidence being rated as "weak" or the other factors potentially having an impact).
<b>Mixed</b>	<u>Findings of individual article -</u> (i) An individual article that finds varied impact of a single intervention across research sites, or populations. (ii) An article examining multiple strands of an interventions that finds some were effective/promising and others not. <u>Findings from a number of studies-</u> (i) Where there have been a number of studies and the results contrast – e.g. some found positive effects and some did not. (ii) Similarly, a body of evidence that is mostly comprised of individual articles finding a 'mixed' impact of interventions would be considered 'mixed' overall.
<b>No effect</b>	No evidence of effect (positive or negative) of the intervention on improving health or wellbeing or includes moderate or strong evidence found the intervention had no effect on improving health or wellbeing.
<b>Negative effect/ Potentially harmful</b>	Evidence that the intervention is associated with worse health and wellbeing outcomes (e.g. worse than at the start of the intervention, or worse than for a control group).
<b>Inconclusive</b>	Insufficient evidence to make a judgement on impact.

### 8.3. Annex C: Evidence of effectiveness decision tree

Evidence of effectiveness decision tree



## 8.4. Annex D: Physical health and wellbeing interventions in Scotland's prisons survey

Please provide the name of the establishment you work in:

\_\_\_\_\_

1. What do you see as the three emerging health needs of the population in your establishment/healthcare centre?

- Reducing use of nicotine
- Reducing harmful use of alcohol
- Reducing harmful use of substances
- Improving mental health and wellbeing
- Increasing uptake of healthy eating and reduce BMI
- Encouraging better oral health
- Promoting use of sexual health clinics
- Reducing transmission of blood-borne viruses
- Increasing physical activity
- Management and prevention of long-term conditions
- Managing the health implications of the prison population as a result of covid-19
- Managing the health needs of the ageing prison population
- Other

If "other" selected, please specify: \_\_\_\_\_

2. What physical health and wellbeing interventions are currently being provided in your establishment/healthcare centre?

- Animal based therapy (e.g., Paws for Progress)
- Arts/Creative (e.g., music therapy/song-writing (Vox Sessions), reading workshops (Open Book))
- Diet-based and lifestyle (e.g., Let's Cook Programme)<sup>12</sup>
- Mindfulness (e.g., Yoga and meditation)
- Outdoors (e.g., Duke of Edinburgh)
- Peer-support (e.g., Listener scheme)
- Sports/Physical activity (e.g., Fit for Life)

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<sup>12</sup> Diet and lifestyle interventions were included in the survey, however as no studies were identified in the evidence review they were not included in the analysis of the results.



3. How would you rate the uptake of these physical health and wellbeing interventions in your establishment/healthcare centre? If the establishment/healthcare centre does not provide an intervention listed, please select N/A

	Poor	Adequate	Good	Excellent	N/A
Animal-based therapy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Arts/creative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Diet-based and lifestyle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mindfulness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Outdoors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Peer support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sports/physical activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. What are the facilitators that best support the delivery of these physical health and wellbeing interventions?

- Physical resources (e.g., facilities and/or indoor/outdoor space)
- Staffing (e.g., staff capacity, staff training or support from third sector organisations)
- Population need
- Supportive partnership agreement with third sector organisation
- Participant engagement
- Positive relationship between participant and personnel delivering intervention
- Scheduling
- Funding
- Geographical location
- Other

If "other" selected, please specify: \_\_\_\_\_

5. What are the main barriers that prevent the delivery of physical health and wellbeing interventions?

- Physical resources (e.g., lack of facilities and/or indoor/outdoor space)
- Staffing (e.g., staff turnover, staff responsibilities/workload)
- Not a population need
- Lack of partnership with third sector organisations
- Difficulty engaging participants
- Negative relationship between participant and personnel delivering intervention
- Scheduling
- Funding
- Geographical location
- Other

If "other" selected, please specify: \_\_\_\_\_

6. Are there any types of physical health and wellbeing interventions missing from the above list that are being provided within your establishment/healthcare centre?

- Yes
- No

If "yes" selected, please name these:

\_\_\_\_\_

7. Are there any physical health and wellbeing interventions within other establishments/healthcare centres that you know of that could be valuable within your establishment/healthcare centre?

- Yes
- No

If "yes" selected, please name these: \_\_\_\_\_

8. Are you aware of any health and wellbeing interventions in the community that you think could be introduced into your establishment/healthcare centre?

- Yes
- No

If "yes" selected, please name these: \_\_\_\_\_

9. If you would like to add anything to your answers, please comment below

\_\_\_\_\_



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