Improving health behaviours and outcomes: An intervention to support engagement in physical activity

Abstract

The purpose of this case study is to offer reflections on the personal experiences, processes of behavioural change; and subsequent outcomes of designing and implementing a collaborative exercise psychology intervention. The intervention, based on Bandura's (1977) Self Efficacy Theory and using self-efficacy related behaviour change techniques (Michie et al., 2015), aimed to provide families affected by health inequalities with opportunities to enhance their understanding of health and make positive behavioural changes. This case is based around one female client aged 48 years of age who took part in the project with her ten-year-old daughter. Pre-intervention the client was engaging in minimal levels of weekly physical activity and reported poor self-rated mental well-being. Through improvements in self-efficacy, achieved through opportunities on the project, the client was able to make notable improvements to her physical activity levels leading to significant weight loss and improvements in mental well-being. From the practitioners' perspective, reflection on areas for future work within the field of exercise psychology, particularly guidance on developing effective client-practitioner relationships with 'hard-to-reach' individuals and groups is warranted. More consideration for the suitability of the PA guidelines for individuals with poor physical and mental health is also required.

Context

At the time of the current case study I was a final year student on the British Association of Sport and Exercise Science (BASES) Supervised Experience (SE) Programme, working towards my accreditation as a Sport and Exercise Scientist. I was also working on a research programme at Edge Hill University, in collaboration with Everton in the Community (Everton Football Club's official charity) focused on family health and physical activity (PA) known as The People's Family Project (PFP). This project aimed to positively impact on a range of health behaviours and outcomes including: physical activity/sedentary behaviours, mental well-being smoking prevalence, alcohol consumption, and dietary quality, however this case study will focus on PA and mental well-being outcomes. Impact was explored via a range of quantitative and qualitative methods, which are detailed within the forthcoming sections. The project beneficiaries were families with pre-school and primary school age children living within the Everton ward of Liverpool in the North West of England,

Research has revealed a distinct link between income, position/social class and health with those from lower socio-economic groups reporting worse health outcomes than their high socio-economic counterparts (Prag, Mills & Wittek, 2013). Data in 2015 identified Liverpool as one of the five most deprived cities in England, with 45% of neighbourhoods across the city as being classified as within the 10% most deprived nationally (DCLG, 2015). Prevalence of adult obesity across Liverpool (25.9%) is higher than the national average for England (23.0%). The proportion of physically active adults in the city has been recorded as 49.5% compared with the national average of 56.0%. The number of adults smoking across the city is also higher than the national average and as a result smoking related death rates are also high. Early

death rates for heart disease, stroke and cancer are significantly higher than the national average (Public Health England, 2015).

One way to effectively challenge the inequalities which disproportionately affect those from lower socio-economic groups (Prag et al., 2013) is through community-based interventions. In particular, this type of approach may help engage those who are reluctant to participate in health services and/or intervention programmes, yet are arguably more at risk of developing lifestyle diseases (e.g. type 2 diabetes) and have been labelled as 'hard-to-reach' (Flanagan & Handcock, 2010). It has also been suggested separately that more holistic and family-orientated intervention approaches may be more effective in promoting and changing health behaviours long-term (Brown, Schiff & Van Sluijs, 2015). Sport organisations, and particularly football clubs have also been presented as ideal organisations for delivering health messages and community-based intervention given their presumed impact on engaging communities. The PFP aimed to address this need for a bespoke family-based intervention within a sport-based community setting targeting families from low socio-economic groups exhibiting poor health behaviours.

Consultant Philosophy

The importance of understanding one's personal and professional philosophies has been previously identified as one of the most important prerequisites of effective sport psychology-based consulting (Corlett, 1996; Poczwardowski, Sherman & Ravizza, 2004). As a BASES SE (and simultaneously MSc student), I was encouraged to gain an understanding of differing philosophical approaches and continuously reflect on my approach to practice. It can be suggested that my approach to philosophy was in part

influenced by my experiences as an elite gymnast, whereby from a young age I was encouraged to share my insights and solutions with my coaches and significant others and also develop as an individual as well as an athlete. These were later the values I began to adopt as a Sport and Exercise scientist and academic researcher, therefore I would classify my philosophy as humanistic – particularly a client-centred perspective which reflects the development of the whole person (Hill, 2001). Through this approach to practice, the client features as the source of behaviour change, and their experiences both guide and shape modification of future behaviour. The professional relationship which develops between myself and my clients also forms an essential part of my practice (drawing upon the characteristics of genuineness, non-judgemental caring and empathy).

Due to my dual role as a researcher and a practitioner, I also would classify myself as a 'pracademic'. McNatt (2010) suggest that there is often a wide gap between academics and practitioners, however through the development of the 'pracademic paradigm' this offers an opportunity to bridge the gap between two original paradigms of research and practice. The underlying premise of this method is that those who adopt this approach are primarily focused on solving-real world problems – in my case this relates to my focus on improving the health behaviours and outcomes of Everton families. However, in doing so I also use my theoretical background to engage in more traditional academic research. I engage in individual, written reflection using Gibbs' (1988) six-staged cyclical model. However, within the current case I also used verbal and shared reflection through conversations with colleagues and my BASES supervisor both prior to writing in a reflective journal, (Huntley & Kentzer, 2013) and

subsequently after such meetings. This process is indicative of a staged reflection process.

The Case

The PFP was officially launched in February 2014 and involved initial formative research through structured and semi-structured interviews with local families to identify the health behaviours, needs and requirements of the potential client group (Bauman & Nutbeam, 2014). A range of sessions were then offered across a 12-week period including: PA-based sessions such as yoga and family fun sessions, social coffee mornings, education/awareness based sessions such as mental health awareness, and family cook and taste sessions, including an educational element. Following the completion of the 12-week intervention, families were encouraged to continue to make use of free/low cost gym facilities and engage with other local PA-based sessions. A full version of the session timetable and main aims and objectives can be found in Appendix 1.

Project participants were families with children aged between 3-11 years. However, this case study is based around one adult client who took part in the project with her 10-year-old daughter, with a focus on PA and mental well-being. Upon signing up to the project the client was 48 years old, unemployed (associated with existing health conditions), educated to GCSE level and lived with her partner of 14 years in a privately rented property. The client's primary reason for signing up to the project was related to the opportunity to spend time with her daughter and become involved in sessions through the local community.

Needs analysis and the presenting issues

A range of quantitative and qualitative methods were used to provide an insight into the physical and psychological needs of the client. The client completed a health goals sheet, identifying her PA/health goals and project aspirations. This information was used to inform an initial semi-structured interview to gain further insight into her current health behaviours, goals and desires. This process was also important for building initial rapport (Sharp, Hodge & Danish, 2015). Arnold and Sarkar (2014) made reference to the importance of gaining trust and respect of clients but also being accessible and building quality relationships with individuals and organisations in order to be a successful (sports) psychologist.

Objective measures of PA and sedentary behaviour were collected via a wActiSleep-BT wireless accelerometer monitor, to measure body movements in three orthogonal planes: vertical, mediolateral and anteroposterior. This device provided information about the client's moderate-vigorous (MVPA) levels, which could then be compared to the current CMO guidelines for PA (Department of Health, 2011), alongside daily sedentary behaviour and daily/weekly light activity. Anthropometrical measurements in the form of height and weight were also taken, which allowed body mass index (BMI) score and classifications to be calculated.

The client self-completed the Warwick-Edinburgh Mental Well-being Scale (WEMWBS), a widely used and validated (Lloyd & Devine, 2012) scale of well-being which focused exclusively on positive aspects of mental health (Tennant, Hiler, Fishwick, Platt, Joseph, Weich, 2007), to assess attributes of mental well-being including both hedonic and eudaimonic perspectives. When using this scale, clients

147 are required to attend to their thoughts and feelings over the previous two weeks and
148 provide responses to statements such as ‘I’ve been dealing with problems well’ and
149 ‘I’ve been feeling confident’, and uses a Likert scale from 1-5 with one being none of
150 the time and 5 being all of the time.
151
152 Results demonstrated that whilst the client engaged in around 217.17 minutes of
153 moderate activity per week, none of this activity was yielded from bouts of >10 minutes
154 therefore she was failing to meet the UK PA guidelines of 150 minutes of MVPA per
155 week through bouts of 10 minutes or more (Department of Health, 2011). The client’s
156 BMI was also 44.6, which classified her as obese (WHO, 2000). Physical inactivity
157 increases the risk of many adverse health conditions and non-communicable diseases
158 such as type 2 diabetes, breast/colon cancers, coronary heart disease, and also
159 shortens life expectancy (Lee, Shiroma, Labelo, Puska, Blair & Katzmarzyk, 2012).
160
161 The clients’ score on the WEMWBS was 42, which is below the English population
162 mean of 52.3 for adults +16 years old (Health Survey for England, 2012). Mental well-
163 being has been defined as ‘a greater amount of positive affect than negative affect,
164 along with favourable thoughts, such as satisfaction with life’ (Diener, Emmons, Larsen
165 & Griffin, 1985, p. 543). Within the semi-structured interview component, the client
166 reported that she had been with diagnosed with depression, anxiety and agoraphobia,
167 noting these conditions had often prevented her from taking part in activities both
168 individually, and with her daughter, and as a result she had lost contact with friends
169 and extended family members. Previous research has highlighted that individuals with
170 diagnosed mental illness experience a range of barriers when engaging in PA e.g.
171 high levels of perceived stress, low mood and a lack of self-confidence and/or social

support (Vancampfort, Firth, Schuch, Rosenbaum, Mugisha et al., 2017). Alongside these diagnosed mental health conditions, the client had limited previous exposure to common PA environments such as gym facilities and poor previous experiences related to this type of activity. The client therefore discussed qualitatively that she exhibited low levels of self-efficacy in relation to PA and health, but also appeared to lack confidence in herself more generally, particularly related to her physical appearance.

It has been suggested that people are moved to act (including in relation to the engagement in PA and exercise) by a variety of different factors (Lox *et al*., 2014). According to Self Determination Theory (Ryan & Deci, 2000), on the one hand people can be motivated because they value a particular activity (internal motivation), or they can be externally coerced into engaging in a behaviour or undertaking an activity, for reasons external to the self. Environments which promote the individual's experience of autonomy, competence and relatedness also help to foster the most volitional and high quality forms of motivation and engagement for those activities. Previous literature has highlighted how individuals for whom motivation (for an activity), comes from within have more excitement, interest and confidence, which is then manifested as enhanced performance, persistence, creativity, self-esteem alongside greater levels of general well-being (Ryan, Deci & Grolnick, 1995). When the client discussed her reasons for 'signing up' to the intervention, she gave social and weight loss reasons as her primary rationale, alongside a desire for her child's enjoyment which is indicative of identified regulation (a form of extrinsic motivation) and a lack of internal or intrinsic motivation. However, this type of motivation does fulfil the basic psychological need for relatedness (Ryan & Deci, 2000).

Intervention

Prior to the commencement of the project, the client and I discussed her health goals and the types of activities which would help her to achieve these goals. Initially it was decided that the yoga and walking sessions would be less appropriate due to health restrictions in the form of arthritis, but she was interested in attending all other session types (full details of which can be found in Appendix 1). The aim of the intervention was to provide the client with opportunities to engage in PA and become more physically active, based on Bandura's (1977) Self Efficacy Theory, which has been widely used and applied in PA-based interventions within inactive populations (Ashford, Edmunds and French, 2010).

This theory suggests that there are four fundamental sources of self-efficacy: past performance accomplishments, vicarious experiences, social persuasion and physiological/affective states. Behaviour change techniques which related to self-efficacy, based on the taxonomy of physical activity as outlined by Michie, Ashford, Sniehotta, Dombrowski, Bishop and French (2015), were also adopted. For example – within the gym sessions, guided goal setting was used to set attainable weekly targets with the client. Information about the behaviour change techniques adopted through different session types on the project, alongside specific examples of use can be found in Appendix 2. The client was also interviewed again six weeks into the intervention, to obtain insight into her self-efficacy levels and resultant behavioural change, together with weekly meetings with myself in order to discuss her progress and goals.

Intervention impact and evaluation

Intervention impact and progress was assessed via repeat quantitative measures (PA – accelerometer measurements, mental well-being – WEMWBS), details of which can be found in the needs analysis section, and qualitative interviewing and insights from the client one week after completion of the intervention – with a particular focus on impact on PA-related self-efficacy. Post-intervention, while the client was still not engaging in sufficient MVPA to meet the UK guidelines (through bouts of >10 minutes of activity), she had increased this type of activity from 0 minutes (pre-intervention) to 41 minutes post-intervention. She also definitively reported the positive changes she had made to her PA patterns, suggesting that she had become more active in general; but in particular was now engaging in more structured exercise and had joined a local gym, something she would not have had the confidence to do prior to attending the project sessions. Her BMI had also dropped from 44.6 to 41 post-intervention. Additionally, the client's self-rated mental well-being score had also increased from 42 (pre-) to 60 (post-intervention). Maheswaran, Weich, Powell and Stewart-Brown (2012) have suggested that an increase of 3 or more on the WEMWBS scale can be considered a meaningful change.

Previous research has identified that a lack of self-efficacy may prevent individuals from engaging in PA (Prabu, Pennell, Foraker, Katz, Buckworth & Paskett, 2014). While increasing self-efficacy is considered an effective mechanism for increasing PA and thus interventions which implement behaviour change techniques which focus on increasing levels of self-efficacy have been found to be effective (French, Olander, Chisholm et al., 2014). While, other studies suggest that improvements in self-efficacy, related to PA may help to alleviate negative mental health outcomes such as stress

and depression through the generation of feelings of accomplishment and the ability to cope with daily stressors (McAuley, Mailey, Szabo & Gothe, 2013).

The current case study supports this research, as providing the client opportunity to develop self-efficacy (both PA self-efficacy belief and barrier self-efficacy) underpinned the changes the client was able to make to her PA behaviours, which led to the observed changes in her mental well-being. However, these positive changes would not have occurred as readily or successfully if it were not for the mutually supportive environment of both the project and intervention, which allowed for the development of internal competencies and thus influenced participant's health behaviour.

For the client, who prior to attending the sessions had little interaction with anyone outside her immediate family, the social benefits she was able to yield from interacting with myself as the practitioner alongside, other delivery/research staff were central to the changes she was able to make to her physical and mental health. Within the literature the relationship between Sports Psychologist and client has, for some time, been identified as the most important element of consultancy work. According to Sharp et al., (2015) amongst others, the practitioner qualities of honesty, commitment, knowledge and expertise, counselling skills and professional ethical behaviour are needed to create an effective consultancy relationship. Although there is no known research which has explored the qualities of Exercise Psychologists specifically, building effective relationships could be seen as vital when influencing behaviour change of inactive clients within an exercise psychology capacity.

Staff, many of whom were from the local area (and therefore whom participants may have been able to identify with), also acted as positive role models for the client. Setting examples for good overall health, including both physical, mental and social aspects (Bandura, 1986) and also using verbal and non-verbal tactics to increase the client's self-efficacy. The intervention also brought together families from a similar demographic area, with children around the same age, therefore attending the intervention sessions allowed the client opportunity to benefit from social support-based interactions between families. Molloy, Dixon Hamer and Sniehortaa (2010) reported that higher levels of social support is associated with higher levels of PA in young adults, and that women have a greater need for companionship and emotional types of PA support compared with men. Families were also able to be motivated from the performance accomplishments of others – i.e. families remaining engaged within PA both within the project sessions and that external to the project.

The design of an intervention which allowed families to take part in a variety of different PA and diet based sessions, promoted self-efficacy in the form of performance attainment, which has been described as the most powerful of efficacy sources as it is based on personal experience of success and failure (Bandura, 1986; Biddle et al., 2015). In relation to PA specifically, the PA-based sessions provided participants with opportunity to experience the physiological states of exercise within a controlled environment. Bandura (1986) also suggests that social comparison information is important in self-efficacy beliefs, and through engagement with the project, and on the proviso that they were inclined or predisposed to, families were able to imitate the positive health behaviours of each other and also staff members.

However the effectiveness of the intervention was not only assessed through behaviour change and the adoption of positive health behaviours leading to improved health outcomes, but was also judged by session attendance and qualitative (formal and informal) feedback from the client. The client engaged well with the project intervention, and with the support of trained staff members attended 36 sessions across the twelve week intervention period: 21 PA (family fun and gym sessions), all seven ‘one off’ education sessions on offer, three ‘cook and taste’ sessions and five social sessions, providing her with a number of positive experiences or past performance accomplishments which could then be drawn on in the future. The client made reference to these sources of self-efficacy in qualitative discussions post-intervention.

Lessons learned and reflections

Due to the increases in MVPA and self-rated mental well-being demonstrated through the case study, I would consider using the same approach again for work with inactive clients, particularly those who at baseline/needs analysis reported suffering from poor experiences of PA and exercise and low levels of self-efficacy. For the current case study, due to the number of quantitative and qualitative measures being taken and to minimise client burden, self-efficacy was not measured quantitatively. While the relationship between PA and self-efficacy is already well-established (McAuley & Blissmer, 2000; McAuley et al., 2013), it is acknowledged that quantitatively tracking the self-efficacy across the intervention period, may have been useful and is something that will be explored within future work.

Insights from the current case study also highlight a potential need to review the current PA guidelines, to set more realistic national targets for PA which are achievable by individuals from a variety of different backgrounds and circumstances, particularly obese, sedentary individuals with poor physical and mental health (Weed, 2016). Results also highlight how making small changes to benefit overall health, particularly through engagement in light and informal PA, may lead to benefits to well-being as an alternative to the promotion of more intense and structured forms of PA which may also be considered unattractive and unachievable to inactive clients (Downward & Dawson, 2015). Indeed, the Sport England (2016) strategy subsequently noted the biggest health gains and therefore the best value for public investment is found in targeting those who are the least active.

However, while the intervention had a positive impact on the health behaviours and psychological outcomes of the client, she did require a high level of physical, social and emotional support throughout the intervention period. I maintained regular contact with the client over the phone and sent text message reminders prior to every session. At times, these reminders felt very time-consuming and I was worried that I was somewhat coercing the client into attending, however when I spoke to the client directly about this during an interview six weeks into the programme she said:

> I think the texts off you keeping us organised was one thing, saying, "Right, we've got this tomorrow", and it was good, because I could get my head round it, whereas I wouldn't just say, "right, I'll get up tomorrow, and I'll go and do the gym, or, "I'll go for a walk with [daughter's name]". Because it was there, and we had you there as support, it made me do it.

As well as discussing the client's progress in relation to her health and PA activities during weekly meetings and within sessions, as the project developed, and the rapport built between myself and the client, she also began to divulge more about her wider life, and goals and ambitions, particularly related to employment. While this wasn't the primary outcome of the project, I felt glad that she felt comfortable in talking to me, and secure in the fact that we had developed a very good level of rapport. From this point onwards, while the client often made reference to the knowledge and experience she had gained through being involved with myself and other staff members on the project. Many of the comments she made in relation to staff were focused more on personal skills or their ability to connect with her and her daughter, highlighting the importance of the qualities of honesty and commitment, as identified by Sharp et al., (2015).

This reflects the importance of client-practitioner relationship particularly when working with hard-to-reach individuals and groups (Crosby, Salazar, DiClemente & Lang, 2010). However, more emphasis could have been placed on the importance of the client taking responsibility for their own engagement. Therefore, encouraging the client to provide more regular updates about their progress, thoughts and feelings either verbally or in written format, may have been beneficial. This approach may have helped to promote independence/autonomy which may have been useful for maximising the likelihood of the client sustaining the positive changes she was able to make to her health behaviours in the long-term. Due to the relationship that developed between myself and the client, this also reinforced the importance of setting appropriate professional boundaries and also putting in place clear referral strategies,

for any issues that could arise, particularly related to mental health (McEvoy, Enright & Macphai, 2015).

In conclusion the client was able to increase her self-efficacy levels and engage in more regular forms of light and MVPA. Following the intervention she was able to transfer these increases to other environments, for example obtaining membership of an external gym, which is evidence of the generality of self-efficacy (Bandura, 1997). However, there were still a number of constraints which prevented the client from meeting PA guidelines, in particular related to her socio-economic circumstances coupled with poor physical and mental health (Weed, 2016). Further, the presence of a physical health condition in the form of arthritis prevented the client from engaging in a number of low-cost activities such as walking and jogging. It is therefore essential that exercise psychology interventions with individuals from low socio-economic groups incorporate a range of activities that are not dependent on financial resources e.g. gym membership and enable clients to sustain any positive changes to their health behaviours post-intervention.

There is also a need for future research and guidance on developing effective client-exercise psychologist relationships when working with this type of 'hard-to-reach' group (Flanagan & Handcock, 2010). Additional research on the real life significance and impact of programmes on family life is also warranted (Cohen, Schroeder, Newson, King, Rychetnik et al., 2015). This is particularly the case as it can be suggested that in some circumstances, especially in the case of 'hard-to-reach' individuals, even small improvements in the physical, social and mental health

395 behaviours can have a notable positive impact on health outcomes and the quality of
396 life (Downward & Dawson, 2015).
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Appendix 1 - Session timetable and main aims and objectives

Session type & delivery staff lead	Week, day and time	Aims/objective
Social coffee morning Adults (children welcome) - Lead researcher	Mondays (week 1 -week 12) 9:30am -11am	• Offered an opportunity for families living within the local community to meet within a relaxed and informal setting and also discuss the project, future sessions, individual and group progress and follow-up on any themes from the weekly sessions with the researcher
Cook and taste (All family members) - North Liverpool and Sefton food worker team	Mondays group 1 = week 5-7, group 2 = week 8-10 3:45pm-5:15pm	The sessions were designed to equip families with the knowledge and skills to incorporate a healthy balanced diet into their lifestyle. The session was split into a practical cookery session followed by an education session with a different focus each week. • Week 1 - discussed the Eatwell Plate giving detailed information for each of the five food groups • Week 2 - discussed how to read and understand labelling. Discussed salt and used visual resources highlighting the amount of sugar in food and drinks. • Week 3 – discussed budgeting and portion sizes for both adults and children
Mental health awareness Adults and children (separate sessions) - Adults - EitC Mental Health football co-ordinator Children – lead researcher	Tuesday – week 3 4pm-6pm	• Adults - offered an opportunity for adults to gain knowledge around some common mental health conditions and their prevalence (including information about the negative impact of mental health stigma), whilst also gaining an understanding of the link between PA and mental health. • Children – focused on understanding feelings and mood and the importance of friends and family through a variety of games and craft activities
Smoking awareness Adults and children (separate sessions) - Stop smoking adviser - Roy Castle Fag Ends, children – lead researcher	Tuesday week 4 5pm-6pm	• Adults – were provided with information about local community stop smoking sessions and initial education and support around stopping smoking • Children –children were provided with information about how smoking can impact on health, advice on avoiding peer pressure and how to say no to smoking/what to do if a friend is smoking and supporting parents with stopping smoking though a variety of fun games and activities
Employment/volunteering Adults (children's fun PA session at same time) - Adults - EitC volunteer co-ordinator & employment co-ordinator Children – EHU students	Tuesday – week 6 5pm-6pm	• Discussed the benefits of volunteering for health and well-being • Helped adults to learn about the opportunities available through EitC and how volunteers can help with these opportunities • Discussed progression back into employment, CV writing and interview support

Alcohol awareness Adults and children (separate sessions) - Adults - EitC veteran mentor Children – lead researcher	Tuesday – week 7 5pm-6pm	• Reviewed the topic of alcohol and the harm it can cause • Provided an overview of units and what is in different types of drinks • Provided solutions and support including services if parents are concerned about their own/someone else's drinking
Debt management Adults (children's fun PA session at same time) - Financial adviser – Babcock international Children – EHU students	Tuesday – week 8 5pm-6pm	• Discussed managing money and tips for budgeting and keeping on top of spending • Provided information on how to reduce debts or become debt free • Provided contacts to local services to help reduce debts
Lifestyle management Adults and children (separate sessions) - Adults - Edge Hill MRes student and volunteers Children – lead researcher	Tuesday – week 10 5pm-6pm	• Discussed the benefits of physical activity and national guidelines for adults and children • Discussed the importance of a healthy diet for both parents and children • Discussed the benefits of sleep • Educated parents and children about fizzy drink and caffeine consumption
Yoga Adults (children welcome to join in or separate fun session) - Adults - External yoga instructor Children – lead researcher	Wednesdays (week 1 – week 12) 6:30pm-7:30pm	• Provided opportunity to take part in a yoga session which helped to promote relaxation, build core strength, tone muscles, improve posture, increase energy and contributed to overall physical activity
Gym sessions Adults and older children (children's fun PA session at same time) - Adults - EitC Health and Well-being practitioner Children – lead researcher	Thursdays (week 2 – week 12, after induction in week 1) 1:15pm-2:15pm	• Small group gym sessions were carried out with support from a number of personal training staff which allowed adults to work on specific training goal • Parents were also educated about overall health including the importance and benefits of drinking water and a healthy diet
Stanley Park Walk/cycle All family members - Choose freedom - Cycling development officer/walk co-ordinator	Fridays (week 1 – week 12) 11am-12:15pm	• Offered an opportunity for families to meet up and interact in a social environment while engaging in light physical activity/walking

Appendix 2 - Session type and behaviour change techniques adopted related to physical activity and eating behaviours with key examples and target variables. Italic figures in parentheses refer to each technique's corresponding number on Michie et al's (2011) taxonomy

Session type	Behaviour change techniques adopted	Examples of use and target variables
Social coffee morning	• Goal setting (behaviour) & weekly review of behaviour goals *(5)* • Barrier/identification/problem solving *(8)* • Prompting focus on past success (*18)* • Action planning *(7)* • Provide feedback on performance (*19)* • Prompt practice (26) & use of follow up prompts *(27)* • Facilitate social comparison *(28)* • Provide normative information about others behaviour *(4)*	*(5)* All family members were encouraged to make behavioural resolutions related to any aspect of their health e.g. reduce sugar consumption, for some families these were made weekly and for others less frequently, however were reviewed during weekly coffee mornings. = **Motivation and self-efficacy** *(7)* Families were also encouraged, where possible (with the support of the delivery staff to specify the minimum level of acceptable change e.g. cut down sugar to one teaspoon = **Habitus/habit and motivation** *(28)* Weekly group sessions provided opportunity to mix with others "in the same boat" which may have helped to change perceptions and improve self-efficacy. Weekly discussions in coffee mornings provided opportunities for parents to compare their own behaviours and health and their children to others. **= self-efficacy and motivation**
Cook and taste	• Provide information about the consequences of behaviour both general *(1)* and individual *(2)* • Fear arousal *(32)* • Provide instruction on how to perform the behaviour *(21)* • Model/demonstrate the behaviour *(22)* • Prompt identification as role model *(30)* • Prompt practice (*26)*	*(1,2*) During the education element of the session families were given information about a particular theme each week e.g. sugar and what impact poor health choices can have on health. Where possible, visual aids were used e.g. bottles of fizzy drinks and the relevant weights of sugar in each. **= capital and motivation** (*21,22*) Families were provided with recipes, ingredients and facilities and were first of all given instructions (both verbal and written) from delivery staff, then shown visually skills such as knife or measuring skills and then given opportunity to cook a meal within the session **= habitus/habit and self-efficacy**
Family fun	• Prompting generalisation of a target behaviour *(15)* • Provide instruction on how to perform the behaviour *(21)* • Model/demonstrate the behaviour *(22)* • Provide information on when and where to perform the behaviour (20)	*(21, 20)* Families were provided with ideas about games they could play with their children at home and also provided opportunities to engage in the games in free outdoor spaces e.g. the park which could then be replicated by families outside the sessions. **= motivation, capital, habitus and self-efficacy**

Yoga	• Provide information on when and where to perform the behaviour (20) • Provide instruction on how to perform the behaviour *(21)* • Model/demonstrate the behaviour *(22)* • Prompt practice (*26)*	*(21,22*) The yoga instructor not only provided instructions related to yoga poses and techniques but also took part in the session in order to model the behaviour to parents **= self-efficacy**
Gym sessions	• Goal setting (outcome) *(2)* • Provide information on when and where to perform the behaviour *(20)* • Provide instruction on how to perform the behaviour *(21)* • Model/demonstrate the behaviour *(22)* • Plan social support/social change *(29)*	*(2)* Guided goal setting was used to set weekly targets with each family **= Motivation, habitus and self-efficacy** *(29)* A whole family approach was embedded throughout the project (i.e. all family members encouraged to attend the sessions and change behaviour encouraged to change their own behaviour. The group as a whole were also encouraged to attend local activities together and help each other out (e.g. provision of lifts) **= figurations, motivation and self-efficacy**
Stanley Park Walk/cycle	• Provide information on when and where to perform the behaviour *(20)* • Shaping *(14)* • Action planning *(7)*	*(20)* Families' were provided with opportunity to engage in walking/cycling sessions in free outdoor spaces. Further information about other walking groups and local parks and facilities were also given to parents. **= motivation, capital and self-efficacy**
Lifestyle management	• Provide information about the consequences of behaviour both general *(1)* and individual *(2)* • Prompting focus on past success *(18)* • Goal setting (behaviour) *(1)* • Fear arousal *(32)* • Relapse prevention/coping planning *(35)*	*(18)* Families were encouraged to think of a time they have successfully carried out a behaviour or made a change related to their health in order to increase confidence. **= self-efficacy**

*Feedback on behaviour including adult and child physical activity levels was also provided in line with quantitative research elements being collected (pre-intervention, post-intervention and 12 month post-intervention) and was also discussed informally within other sessions . Parents were also encouraged to self-award successful behaviour alongside providing incentives for children.