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1.0 Write up participants results in an appropriate format.

Miss X was chosen to engage in a 10-minute interview, this was conducted to assess the main motives and barriers presented in relation to Physical Activity. Prior to conducting this interview, the participant signed an Ethics form.

The predominant barrier the individual presents is a physical disability, Multiple Sclerosis. Miss X identified physical symptoms of fatigue and foot drop; therefore, she has weakened muscles in her legs and limited mobility and strength in her arms. These are the following statements Miss X clarified with regard to her disabilities:

“am tired because of my condition, fatigue is a major issue.”

“multiple sclerosis which has resulted in foot drop whereby my right leg is very heavy and I use a facilitated stimulation.”

“limited mobility in my arms the strength is affected by the disease.”

The strength within her arms is vital as she reported to using crutches to support her with walking and with a loss of strength in her arms this can induce risk of falling. This is seen in the statement below:

“and I have crutches to support my walking.”

Due to this condition Miss X has difficulty participating in all forms of physical activity, thus daily tasks are difficult and, as a result, physical exercise is limited.

“I should exercise more each day, but for me even just walking out to the kitchen and doing the dishes is an exercise in itself.”

Currently the physical activity she enjoys is a motorised bike which she independently pedals, but when her legs are tired the bike moves her legs for her. This assists her when she feels very fatigued and unable to move.

“The only activity that I perform now is with my motorised bike which is um static and I cycle possibly up to 30 minutes every other day and when I am tired the bike will move my legs for me.”

Miss X discussed that music acted as a motivation while on the motorised bike as the task is tedious; this form of motivation could be used in motivating the client in other forms of exercise.

“I find that music is very good in motivating me to do exercise on the bike and first few minutes if I don’t have music it is a very tedious.”

Miss X mentioned that she attempted to join a yoga class, but was told she would be unable to participate due to limited ability to move from the floor. A class within her physical capability will benefit her both in the aspect of maintaining physical exercise and also feeling inclusion with people enduring similar physical difficulties.

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“I tried to do a yoga class but because I [sic], it involved movement on the floor, um they said that I wasn’t able to join the class.”

In the interview she discussed that she uses a motorised scooter when going to the beach with her daughter for support. Although, the participant is unable to walk a long distance she has reported enjoying fresh air. The motive of being outdoors and having ‘fresh air’ is clearly very important to the individual, the appreciation of outings could be enhanced due to the client’s lack of ability to be outdoors independently.

“Possibly just getting fresh air even though I don’t walk a great deal um just going out for a walk a great deal and just going out for a walk when my daughter takes the dog for a walk, I have fresh air.”

The individual described previous activities she enjoyed although these activities are now unavailable to her due to her physical disability. The physical exercise she participated in was squash, a two-person racket sport, and cycling, as stated below. Additionally, she added that currently she feels limited in the activities she can do, thus she is finding adaption to her disability difficult.

“I used to enjoy going for bike rides, playing squash but now I can’t do it so I am limited to the activities that I can do.”

In regard to daily routine the individual discussed that although physical activity can be time-consuming, she has nothing set in her daily routine and therefore half an hour a day is not an issue. Whilst answering this question the interviewee laughed awkwardly suggesting that she has nothing else to do with her days, thus showing the significant impact of her disability on her daily routine.

“Yes, it is time consuming but (interviewee laughs) I have nothing much else to do with my day so to find half an hour a day is no problem.”

A question was asked in regard to the seasonal implication to physical activity and whether this presents as a barrier and/or motive. The individual did not feel that the seasons caused a major impact, the only mention being that in the summer months the heat causes increased fatigue.

“not really, in the summer if it is too hot, then I get very, very tired. I am better in the winter months even though the nights are darker earlier um. It doesn’t really affect me the winter months.”

There is currently a pandemic with the virus, Coronavirus, which has presented challenges due to a national lockdown and in particular for disabled and vulnerable people to self-isolate. At the end of the interview questions were given to assess the impact this has had on the individual. Prior to Coronavirus the individual reported enjoying swimming, for which she required support to push her wheelchair to the poolside. This is an aerobic exercise to promote after the pandemic.

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“I used to go to the leisure centre but since Covid I do not go there, and I needed somebody to come into the pool with me or to wheel me into the pool but um that’s been taken from me at the moment.”

Conclusively, the main motives identified by the participant are health benefits of exercise specifically in relation to having a disability, social motives, music as a distraction, green space environment, lack of routine and the need to fill time. In regard to barriers the primary being having a disability Multiple Sclerosis and the several correlating issues these being lessening in independence, lack of exercise classes available and requiring support to attend exercise classes.

1.1 Evaluate the results in light of previous research.

Multiple Sclerosis is a chronic autoimmune (due to abnormal activity of the body's immune system) disease of the Central Nervous System. The disease aetiology is characterised by inflammation and neurodegeneration of both the Myelin Sheath Axons (Myelin Sheath wraps around fibres, known as Axons, which send and receive nerve signals), and the Cerebellum (structure within the brain with the main function in motor skills such as walking and balance), Grey (area that processes information in the brain) and White (tissue in the brain composed of nerve cells, covered by myelinated axons) matter (Sally et al, 2019). Dalgas and Stenager (2012) conducted a literature review on the evidence provided for physical activity and MS. This review found that 80% of MS patients have the disease for more than 30 years, with an average of 5 to 10 years of life being lost.

The progression of the disease results in a reduction in aerobic capacity, muscular strength, and walking (Sally et al, 2019). This presents in a variety of symptoms including fatigue, numbness, deterioration of physical mobility and cognitive function, furthermore, there is the psychological comorbidity anxiety and depression (Barnard et al, 2018 & Motl et al., 2017). The nature of the disease being chronic (long-term) and physically disabling, signifies the necessity of physical activity being crucial in maintaining independency and quality of life. The promotion of physical activity is to manage symptoms, restore muscle function, enhance the ability to participate in activity of daily living and consequently enhancing quality of life.

Motl et al (2017) conducted a review of the evidence on the benefit of both aerobic and resistance training exercise training in physiological and psychological functions, these being walking mobility, balance, cognition, fatigue, depressive symptoms, and overall improvement on quality of life. A balance of both exercises has demonstrated a positive impact on walking, strength, and balance. The participant discussed previously enjoying aerobic exercise cycling and playing squash although currently has adapted due to her health condition and uses a FES (Functional Electrical Stimulation) stationary bike and goes swimming. Therefore, promoting aerobic exercise for the participant will assist in physical mobility and maintaining independence and quality of life.

As stated within the interview *"The only activity that I perform now is with my motorised bike"*, the participant discussed using a motorised Functional Electrical Stimulation cycle (FES). This stationary bike works by electrical stimulation to the lower limb muscles, which is timed to generate cycling contractions to propel the cycling ergometer. Sally et al (2019), conducted a systematic literature review assessing the impact of FES cycling on Cardiovascular, Musculoskeletal, and functional outcomes. The majority of the 9 papers reviewed were not conclusive because the papers cited contained insufficient sample sizes to prove statistical significance. This review concluded that the FES bike has a positive benefit on aerobic fitness, whilst additionally increasing aerobic capacity; it also reduces the risk of Cardiovascular disease (CVD).

The environment provides a motive to physical activity and as stated in the interview, the client finds the beach and outdoor environment beneficial to reducing stress. Woeller et al (2018) supported this finding in a small-scale study (n=50) conducted using a profile of mood

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state (POMS) questionnaire to measure implication of environment to mood state. This study found that green space exercise was effective in reducing stress on average after just 5 minutes. It also concluded that the green space natural environment enhances the psychological benefits of exercise. Silva et al. (2019) conducted a study based on environment enrichment and correlated the findings of Woeller et al. in regard to beneficial impact on reducing cognitive deficits, memory, and anxiety. In addition, Silva et al (2019) found that environment enrichment has a positive implication in that it reduced peripheral inflammation in rats with neurodegenerative disease.

Barnard et al (2018) conducted a qualitative study group analysing the main barriers to exercise as reported by participants with Multiple Sclerosis; these being lack of time, support, motivation, injuries, and other MS symptoms, primarily fatigue and pain. Due to the relapses and physical deterioration of Multiple Sclerosis, physical activity requires consistent adaption (Ploughman, 2017). The following looks at how psychological theories are used in implementing strategies to overcome these barriers and therefore change behaviour.

1.2 Relate the findings to current behaviour change theory.

The psychological theories provide a model in order to understand behaviour and emotions. Due to impacting factors on behaviours and barriers, the appropriate strategies are implemented to support positive behaviour change. The main theories that this report will discuss in relation to benefiting the subject interviewed are the following: Social Cognitive Theory, the Health Belief Model, and the Transtheoretical Model of behaviour change.

Social Cognitive Theory focuses on the main adaptable patterns of behaviour, these being self-efficacy, outcome expectations, barriers, and self-management strategies. By increasing self-efficacy and setting realistic outcome expectations this will increase confidence and self-belief (Silveira, Richardson and Motl, 2020). An appropriate exercise class with disabled adults will provide both enhancement in self-belief and feelings of relatedness. The Health Belief Model theory provides a theoretical substructure for understanding that an individual's self-belief of a current or possible illness provides an emphasis for the motivation to be physically active. In regard to the individual's interview, the main motivation will be the benefits in regard to MS, primarily due to the desire to prevent these negative health conditions. (Kasser and Kosma, 2012). The transtheoretical model is a five-stage process of behaviour change, these being pre-contemplation, contemplation, preparation, action, and maintenance. This model demonstrates a strategy for increasing physical activity and exercise based on motivation to change (Levy. et al., 2009). The participant is currently at the preparation stage as she has begun to add physical activity into her routine by currently using a motorised exercise bike "*30 minutes every other day*" and goes swimming. Although Miss X has identified that she could do more, specifically stating "*Um, I could do some chair exercises*" but requires the support and motivation to action.

Beckerman et al. (2010) conducted a small-scale study (n=106) developed by a questionnaire based on the Pleasure, Arousal and Dominance (PAD) Model. This questionnaire interlinks the international classification of functioning disability and health in correlation to MS and the theoretical models of social cognitive theory, the transtheoretical model, the health belief model, the protection motivation theory, and the theory of planned behaviour. Therefore, it aims to assess the impact of various barriers and motives of physical activity in adults with MS, including disease characteristics, cognitive-behavioural impact, demographic and environmental. Consequently, this study demonstrated the following results: 33% had intentions, 31% were uncertain and 36% had no intention to increase physical activity. Brooks et al. (2018) conducted a similar larger-scale study (n=198) in individuals with chronic musculoskeletal pain with the variables including pain intensity, functional disability, with the theories being self-determination theory and the theory of planned behaviour. The evidence within this study showed that both theories combined have an importance in both the pre-contemplation and motivation stages of exercise.

Levy et al. (2009) conducted a study in subjects of a small scale (n=105) over a period of a year to assess the adaptations to physical activity and the stage of Transtheoretical Model of Behaviour. As a result, this study demonstrated that individuals who remained sedentary or

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regularly relapsed from being active had the lowest levels of self-efficacy and contrastingly those who maintained regular physical activity reported higher feelings of self-worth, self-efficacy and overall displayed the greater benefits of exercise.

Psychological theories hypothesize that an effective physical activity promotion scheme needs to be adaptable in regard to factors such as self-efficacy, personal knowledge, skills, current behaviour, social support, perceived barriers, and benefits (Ploughman, 2017). The constant adaption to physical activity due to the deterioration caused by MS as stated above by Ploughman (2017), can directly impact self-efficacy as a result of changes in self-perception, self-worth, and personal goals. With regards to the transtheoretical model of behaviour, individuals who are at the pre-contemplation stage are the most difficult to adapt to exercise (Beckerman et al (2010). Therefore, psychological theories have an importance in health promotion for adults living with a disability and can be implemented by physiotherapists and pain rehabilitation practices (Brooks et al., 2018).

1.3 Suggest an approach or approaches to elicit behaviour change for that particular individual.

Kung & Taylor (2014) analysed data conducted by Sports England National Benchmarking Service (NBS) (a service commissioned by Sports England that offers sports facilities assessment of their service delivery in support of disabled adults). NBS collected data from 458 sports facilities over the 6-year period between 2005- 2011 and concluded that of 150,000 sports participants 9% were disabled adults. Additionally, a survey conducted by Sports England Active in 2010/2011 found that 18% of disabled adults (16 and over) participated in sports for over 30 minutes a week. The English Federation of Disability Sports (EFDS) is the national sports body of disabled adults in England who aim to increase the strategies available and inclusion of sports for disabled adults. By promoting both personal self-esteem and the social inclusion of disabled adults, this will assist disabled adults in overcoming the barriers they face.

Disability Sports Wales are a Government organisation who aim to ensure sports are equally inclusive to disabled and non-disabled adults. A project set up by Disability Sports Wales is called Go Out and Get Active and encourages disabled adults to participate in sports. A club supported by Disability Sports Wales is the Wales Wheelchair Basketball Association. This club runs throughout Wales and provides a social community for individuals who are wheelchair users. As discussed in the transcript, the participant, previous to her disability, had enjoyed playing squash, therefore an adapted sport suited to her current needs would have numerous benefits. This includes enhanced social inclusion, psychological wellbeing and physical fitness. Similarly, chair yoga class would provide the benefits of social inclusion and benefit her muscular strength. Gentleyogainwestwales (no date) provide weekly classes, and this is currently online due to the pandemic. In addition, the MS society has several adaptable yoga classes available on their website (MSsocietyyoga, no date).

The participant currently uses the FES bike; this is beneficial as Scally et al (2019) stated that stimulating the muscles of the lower limbs increases strength, reducing the decline and preserve functions in the lower body. As a result of loss of lower limb function, this impacts on greater weight load on the upper body thus increasing risk of falls. In addition, the FES bike has demonstrated evidence of reducing spasms which is a common and debilitating condition of MS and can be a direct cause of pain (Scally et al, 2019). To motivate herself the client said music helps as a distraction in order to enhance her motivation and so several strategies were suggested. This included listening to the sounds of nature, audiobooks and assessing which songs impact movement.

A project run in England, Wheelsforwellbeing.org (no date), provides accessible bikes and cycling sessions for disabled individuals and their families. They aim to support individuals by providing access to the many benefits of cycling which include, physical, emotional, practical, and social. Simultaneously, a project run in Wales, Bikeabilitywales.org.uk (no date), provides a variety of disability accessible bicycles including electric tandem bikes, arm

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pedalling bikes, wheelchair cycles and tricycles. This centre has flat ground accessible at the front and also has access to green space along a national cycling track.

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1.4 Present ideas for future research in this area.

In conclusion, future research should be conducted on the impact of online exercise classes for disabled adults. In the current circumstances the Coronavirus pandemic has required vulnerable adults to isolate at home, therefore the support needed to participate in physical activity has significantly decreased. Such research should assess the current demand for online physical activity and the current availability. This will have many benefits, for example, social support, motivation, and improving physical wellbeing.

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Transcript

Do you enjoy physical activity, if so why is that activity your preference?

The only activity that I perform now is with my motorised bike which is um static and I cycle possibly up to 30 minutes every other day and when I am tired the bike will move my legs for me.

How do you feel physical activity impacts your mental health and mood state?

Um I feel better when I actually have done exercise but some days, I am tired because of my condition, fatigue is a major issue.

Do you feel exercise is time consuming and how do you add exercise into your daily routine?

Yes, it is time consuming but (interviewee laughs) I have nothing much else to do with my day so to find half an hour a day is no problem.

Do you have any medical conditions which effect your ability to exercise?

Yes, I have um multiple sclerosis which has resulted in foot drop whereby my right leg is very heavy and I use a facilitated stimulation um device which helps move my leg um which I have to charge up every day, and I have crutches to support my walking. I also have limited mobility in my arms the strength is affected by the disease.

Do you find companionship is important to you, do you do any groups or anything with you know a friend or any support networks?

No, it is um I used to go to the leisure centre but since Covid I do not go there, and I needed somebody to come into the pool with me or to wheel me into the pool but um that's been taken from me at the moment.

Do you find you have enough support networks to assist you with participating in physical activity?

Yes, I do but I am limited on the physical activity I can do.

Do you feel that there are any resources locally to exercise within indoor and outdoor settings?

For the majority of people yes but for me no. I tried to do a yoga class but because I, it involved movement on the floor, um they said that I wasn't able to join the class.

How do you feel the seasons impact you in the year do you find you are more active during certain times of the year?

Um, not really, in the summer if it is too hot, then I get very, very tired. I am better in the winter months even though the nights are darker earlier um. It doesn't really affect me the winter months.

Are you aware of the current physical activity guidelines and how do you feel you personally do with the barrier of your physical disability in comparison to the current guidelines?

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I should exercise more each day but for me even just walking out to the kitchen and doing the dishes is an exercise in itself. Any minor tasks which the general population would do I find it very exhausting, but I do try and keep active and do things in the house.

Would you like to increase your physical activity, and do you feel this would be achievable?

Um, Yes, I would like to increase my physical activity. It, it varies from day to day. Achievability depends on the fatigue.

How, do you find it stressful or stress relieving physical activity? How do you find it impacts?

Um It is stress relieving um but also it can be stressful especially if you are aware that I need to exercise but I am very tired but that is when the motorised part of the bicycle is very effective because it helps me it helps mobilise my legs even though I feel too tired to do them myself.

In what way do you think you could incorporate more exercise into your daily routine?

Um, I could do some chair exercises, but I think I need to be motivated to do that. I need somebody with me to do that.

What type of activity grasps your interest; what do you feel you would find enjoyable?

I used to enjoy going for bike rides, playing squash but now I can't do it so I am limited to the activities that I can do but at least I can do some activities with the bike and moving around the house. Possibly just getting fresh air even though I don't walk a great deal um just going out for a walk a great deal and just going out for a walk when my daughter takes the dog for a walk, I have fresh air.

Do you find green space beneficial?

Yes, I do at the time you know that after 15 – 20 mins I feel much better.

Do you find that the social aspect is important to you while exercising?

Not anymore, I don't belong to any classes, so it is not a social activity anymore.

How do you feel comparison before, during and after exercise? How do you feel physically and mentally?

I find that music is very good in motivating me to do exercise on the bike and first few minutes if I don't have music it is a very tedious task but if I don't have any music to help me along with the exercise I but sometimes I don't want to do it but I hear some music and it motivates me and so yet I feel much better afterwards.

And in regard to Covid, I know you mentioned earlier, do you feel that lockdown has impacted your ability to do physical activity and exercise in any way?

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Not a great deal, I used to go to the pool but that was getting less but just using the bike and going for walks, but well I go on my mobility scooter just getting some fresh air um. I have more activity now during Covid than I had prior to Covid.

Do you have access to green space during Covid and lockdown?

Yes, I have the garden, I could sit out in the garden if I wanted to um and I can go to the beach for walks with the dog.

Do you find that lockdown has impacted your motivation at all?

No there isn't much real change. The only thing is sometimes I can't visit my partner to socialise with others as the major social events go to my partners and there is a group of friends where we all get together maybe twice, three times on weekends.

Generally, do you think your routine has changed?

It does change but um we've adapted to it and there is no major problems associated with Covid

Have you tried any new physical activities during lockdown and how has that made you feel?

Only I'm having more fresh air since lockdown um while accompanying my daughter on my mobility scooter it is an incentive because she doesn't drive to go down to the beach, so I've got a lift (hoist) in the back of the car so with my mobility scooter I go for a walk while my daughter takes the dog for a walk.

Thank you very much.

You are very welcome.

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