

**How do individuals with chronic musculoskeletal conditions
conceptualise motivation following a physical activity session, or
intervention and how does this contribute to our current
understanding of their motivation pathway?**

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Abstract

Introduction -

Motivation is a key concept to physical activity (PA) being undertaken, reducing risks of non-communicable disease. The Taxonomy of Motivation Model or Self Determination Theory (SDT) by Ryan and Deci (2000) is a macro-theory providing insights into the concept of 'motivation' and the psychological processes, but little has been applied to the chronic musculoskeletal (CMSK) condition population group. The literature on CMSK conditions is extremely knowledgeable regarding biomechanics of pain and biologically what causes it, however feelings or lived experiences of those with CMSK conditions relating to PA and motivation are lacking. This research meant adding to existing knowledge whilst devising a theorised CMSK condition SDT model for PA, which will benefit future PA promotion and understanding for this population group.

This research aims to understand how individuals with CMSK conditions conceptualise motivation during physical activity, conceptualisation being "*the act or process of forming an idea or principle in your mind*" (Cambridge Dictionary, 2023).

Methodology -

Thematic Analysis (TA) and semi-structured online interviews were used to gain insights into lived experiences of motivational processes. 15 females, aged 20-70+ with various CMSK conditions participated. New/existing themes were devised providing insights into motivational processes for PA.

Findings -

The SDT theory was important for categorising/acknowledging examples of extrinsic and intrinsic motivators, but richness of these examples adds more insights from these qualitative interviews. Evidently, long-term goals are more meaningful to this population group, rather than extrinsic motivators such as, weight loss. From new themes generated, '*the psychological battle*' was most intriguing and a deeper understanding of this '*battle*', the interactions and acknowledgement of this being a '*yielder*' for motivation or '*cross-roads*' was evident.

Conclusion -

Developing findings from the Emery theorised CMSK condition SDT model on similar CMSK populations is imperative for development of future knowledge, public health implementation and societal/policy change.

(300 Words)

Glossary of Terms

CMSK – Chronic Musculoskeletal
CCM – Condition Coping Mechanisms
EI – Exercise Identity
EM – Extrinsic Motivation
IM – Intrinsic Motivation
MSK – Musculoskeletal Conditions
MSD – Musculoskeletal Disorders
MI – Motivational Interviewing
PA – Physical Activity
TA – Thematic Analysis

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Chapter 1 Introduction

The focus for this research is Chronic Musculoskeletal (CMSK) conditions which The Office for Health Improvement and Disparities (2021) states are “*a common cause of severe, long-term pain and physical disability*”, and therefore chronic, being

“a long-term physical health condition that requires ongoing management...cannot... be cured.....controlled with....medical and/or other therapies” NHS Data and Model Dictionary (2022).

The important emphasis here, is “... *can be controlled....medical and/or other therapies*” but to date the (CMSK) population has benefited only marginally from “*other therapies*” the medical model playing the major role in pain control. This is at great cost both to the NHS and to the sufferer, considering that CMSK conditions often co-exist, obesity being one of the social risk factors for CMSK individuals, with 7 out of 10 adults overweight or obese (Versus Arthritis, 2022). The longer duration of the condition the higher the increased risk is (World Health Organization, 2022) yet many CMSK individuals want to manage their condition and quality of life not just by medical interventions but more specific interventions to enable them to live proactively with their condition. The reasoning behind such motivation to participate in social activities is ill-documented within the literature, many motivational models/frameworks relating only to mainstream groups (Pourbordbari et al, 2019).

In contrast, focus on CMSK conditions is limited to a biomedical model. Are we really able to increase quality of life for people with disabilities if many are still stuck in this model? Arguably health is more like Engel’s biopsychosocial model (1977) emphasising treatment of illness through the interaction of biological, psychological and social factors.

While Engel’s model is no longer cutting edge, it is mentioned to highlight the fact that while Engel recognised the need for a multifaceted approach to health problems fifty years ago, little has been put in place to date regarding treating the whole person rather than the symptoms.

Information from this research will allow better insight into motivational pathways and propose the design of an adapted motivation model for this group. It will also assist with future design and information relating to health promotion messaging, by identifying some of the key components of motivational pathways for physical activity. While motivations vary, specific ones will likely stand out for this group, becoming key to their conceptualisation process.

The decision to focus on CMSK conditions stems from two reasons. Firstly, this subject is a long-standing, significant public health concern and burden, identified as far back as 1977 by Engel and emphasised as recently as 2022 by Public Health England,

“Public health systems have often overlooked the needs of people with musculoskeletal conditions and... underestimates the benefits of physical activity...depriving large numbers...of the opportunity to enjoy better musculoskeletal health” (2022).

Corroborated by the Lancet Report (2015), these conditions are

“a huge opportunity for preventive public health” but “....remain under-prioritised compared to their enormous and growing burden” (Arthritis and Musculoskeletal Alliance, 2015).

Add Marmot’s findings that *“people can expect to spend more of their lives in poor health”* (2020) and there exists not only a current major problem for all concerned, but one that has been ongoing for many years.

Furthermore Woolf (2022) suggests the NHS could better serve people by prioritising public health, with particular emphasis on health inequalities. Nicolson et al, (2020) confirm the societal impact regarding long-term MSK conditions being associated with withdrawal, single occupancy, living in deprived areas with multiple health conditions, including mental ill-health. Four in ten MSK adults with a condition live with a mental health condition and are most likely to have used mental health services (Versus Arthritis, 2022). The literature describes an intertwined relationship with mental health and MSK conditions. Tyrovolas et al (2020) identifies

“..a complex relationship between MSK disorders and mental disorders where both conditions can mutually influence each other and create a loop ... leading to the aggravation of both conditions”.

Tyrovolas’ report (2020) prompts a *“call for targeted preventive strategies and intervention policies for mental and MSK disorders”* but it is difficult to develop these, because of lack of insight into qualitative information of feelings about motivation levels for this group. Qualitative research is well placed to provide insight into these psychosocial processes from those with personal experience.

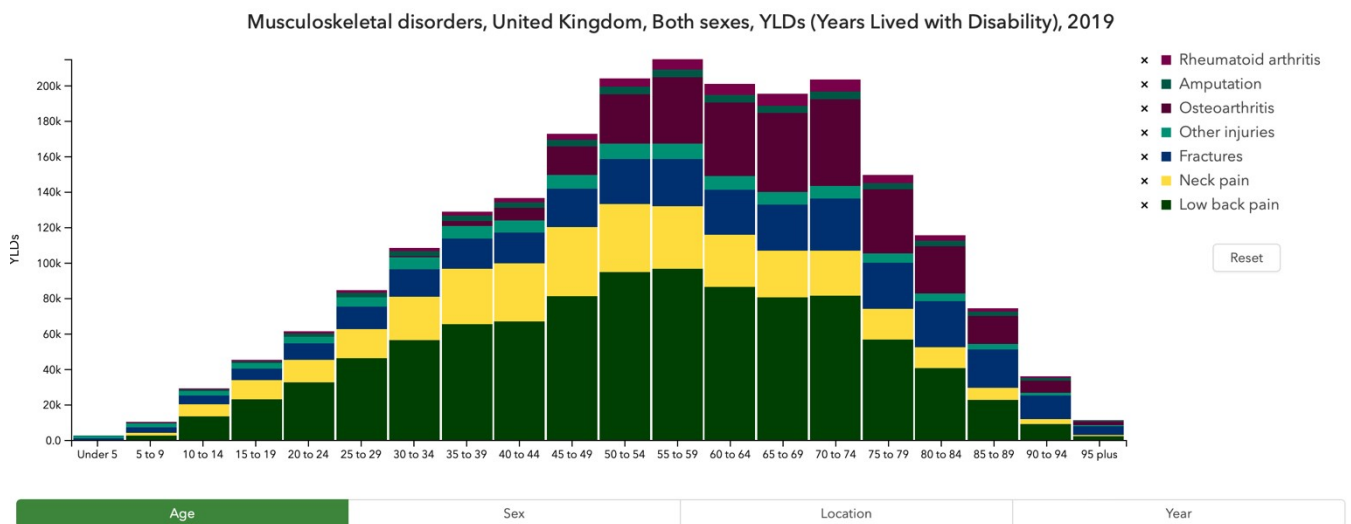
The second reason for this research focus is that MSK conditions are the leading contributor to disability worldwide. There are 1.71 billion sufferers worldwide (WHO, 2022), currently living with CMSK conditions which affect their ability to carry out everyday activities (WHO, 2022) and a leading cause of disability worldwide, MSK conditions require rehabilitation (World Health Organization, 2022). As mentioned, MSK conditions often co-exist and have biopsychosocial impacts on the whole person, creating disability adjusted life years (DALYs) or years lived with disability (YLD). The risk of developing cardiovascular disease and mental health conditions is increased for those with MSK conditions, as they are twice as likely to be physically inactive (Versus Arthritis, 2022). Furthermore, there is a higher prevalence in females (14.5%) with two or more conditions (Office for Home Improvement and Disparities, 2022) and also ethnicity is a wider determinant of CMSK condition prevalence as stated by

the Office for Home Improvement and Disparities (2022). The reason why continues to pose questions.

As chronic conditions rarely get better by themselves, management by alternative intervention and lifestyle behaviours are the better option.

Figure 1 below, is evidence that DALYS/YLDs are prevalent at all ages, but particularly during adulthood. This research, therefore focuses only on adults.

Figure 1:

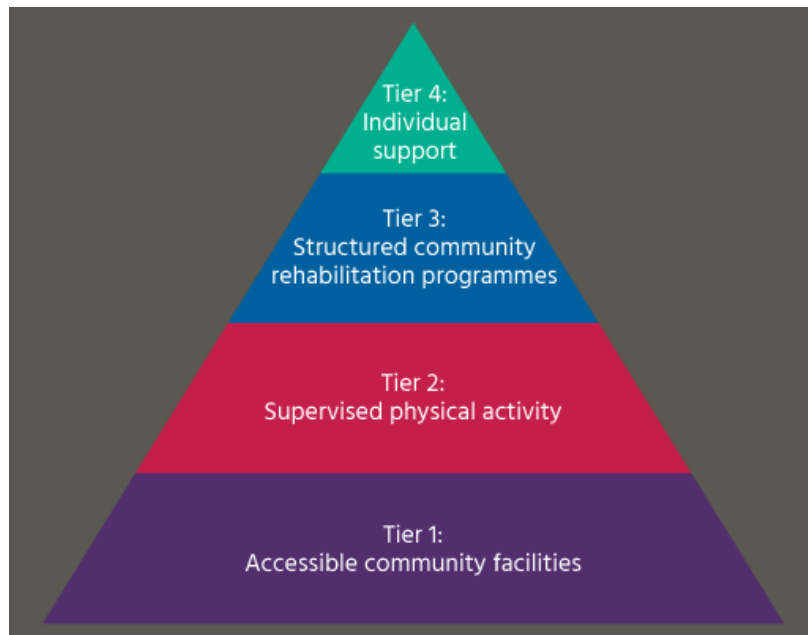


(Institute of Health Metrics and Evaluation, 2019)

Such co-morbidities cost the NHS £5 billion yearly (NHS England, 2022), because of the required treatment and monitoring (Office for Health Improvement and Disparities, 2022), so it is disappointing that none of the PA guidelines are tailored to CMSK sufferers. How can we promote and encourage PA for this group if guidelines are not tailored to them?

The only organisation to date that mentions PA for CMSK conditions is Versus Arthritis. Although tailored to commissioning, Versus Arthritis produced Figure 2 below, 'Musculoskeletal Physical Activity Commissioning Pyramid', showing 4 tiers of provision that *could* be implemented to maximise PA opportunities.

Figure 2:



(Versus Arthritis, 2022)

Each tier is important, but from a qualitative perspective, Tier 4 should be the first step. It is the perspective of the individual and their 'lived experiences' that provide the information required for the other three tiers, *"to maximise peoples opportunities for PA"* (Versus Arthritis, 2022). This research will assist with providing information on barriers and lived experiences and identify individual motivations for PA, which underpin the effectiveness of these tiers. It is essential to recognise that if the individual is not motivated or barriers exist, it is unlikely they will willingly access the proposed tiers.

I am one of these people and my experiences with such a condition, along with those with whom I have shared time over many years, have been my driving force. I am passionate about promoting and improving health and developing greater understanding of conceptualisation of motivation and physical activity for this group.

Furthermore, as a Health Promotion Practitioner, a key part of my role is to ensure that physical activity is inclusive for everyone, enabling me to see how understanding the individual can improve health and wellbeing. Being disabled has made me appreciate, the barriers faced by those with physical limitation, who require more suitable and individually-tailored exercise to better meet personal needs, in contrast to those in mainstream society, whose needs can present as less demanding. Lack of knowledge regarding motivation and exercise for this group is explained more in the literature review, with particular emphasis on CMSK conditions being the leading contributor to disability worldwide.

This research therefore, aims to understand how CMSK individuals conceptualise motivation during physical activity. Conceptualisation is *"the act or process of forming an idea or principle in your mind"* (Cambridge Dictionary, 2023). Are we able to do this alone or, with

our level of pain, do we need extrinsic as well as intrinsic motivation? As explained by Legault (2016)

“... intrinsic motivation denotes the performance of an action out of interest or enjoyment, extrinsic motivation arises from an externally or socially created reason to perform an action...”.

Both are important regarding task compliance and are incorporated as key elements for the Taxonomy of Motivation Model.

1.0 Research Rationale

The research question, therefore, is:

How do individuals with chronic musculoskeletal conditions conceptualise motivation following a physical activity session, or intervention and how does this contribute to our current understanding of their motivation pathway?

This will be addressed by:

1. Exploring aspirations - what the layers of a CMSK individual's key motivators for PA look like.
2. Comparing/contrasting intrinsic/extrinsic motivators.
3. Exploring why instructor-led support is important for motivation for PA.
4. Exploring condition coping mechanisms (CCM) and 'self-monitoring' - what this feels like regarding motivation for PA.
5. Exercising identity (ID) - what thoughts/feelings/aspirations come to mind during exercise, and how they influence PA motivation.
6. Understanding what the barriers to motivation are.

Chapter 2 – Literature Review

Most research on CMSK and PA, appears to communicate how relatedness and autonomy are prevalent in influencing motivation for PA. However, the reasons behind these i.e. *‘peeling back the layers of the onion’* are little understood to date and therefore require further research. The grey literature provided an insightful level of individualism regarding psychological pathways for motivation for PA in terms of case studies. Without grey literature, deeper understanding of motivation is limited for CMSK groups. Coupled with the theory-driven aspects in relation to Taxonomy of Motivation Model/Self Determination Theory (SDT), only general rather than specific information can be provided. One could argue these elements - autonomy, competence, relatedness - all conceptualise motivation in some way, but to what deeper meaning remains to be answered.

2.0 Search Strategy

Reference is made to twenty six research papers, all of which met inclusion criteria but excluded grey literature. The databases used for the search were found via the Boolean terms (Adult*) AND (Motivation*) OR (Musculoskeletal Conditions) AND (Exercise*), these being the most suitable to source qualitative research. Grey Literature was also searched to complement the database search strategy.

Inclusion criteria included papers that were 10 years old or less, referred to chronic musculoskeletal conditions lasting 3+ months and written in English language, qualitative research only.

Including papers 10 years old or less allowed adequate data to generate results, without becoming overwhelming. Klerings (2023) supports this approach in that *“if most studies ... were published 10 years ago, then an arbitrary cut-off of ‘the last 5 years’ will miss many relevant studies”*.

Selecting 2012-2021 as the 10 year gap enabled older and recent studies to come to the fore, with perspectives utilising previous and current knowledge to help merge this gap and minimise contradiction.

Exclusion criteria included papers that involved children, were written in a non-English language and covered non-musculoskeletal conditions, as they were not specific to the research.

Table 1, below presents the literature review process.

Table 1

Database Library	Results
CINAHL Complete	• 56 results • 5 papers did not meet inclusion criteria.

	• 51 results • 30 did not meet inclusion criteria. • Eynon et al, 2019 and Vansteenkiste et al, 2020.
PsychINFO	• 3 of 3 research studies • Only 1 met inclusion criteria Ji Rung Wu et al, 2021.
Cochrane Library	• 74 trials • Some excluded for not meeting inclusion criteria. • Many were 'randomised controlled trials' instead of qualitative methods. • Two relevant papers Gaskell et al, 2018, Stockdale et al, 2014.
Wiley Online Database Library	• 3 results • 1 excluded for not meeting inclusion criteria. • Kibblewhite et al, 2016, Booth et al, 2018.
PubMed Library	• 150 results – some medical trials, non-qualitative. • 3 qualitative papers meeting inclusion criteria. • 2 excluded for not meeting inclusion criteria. • Smith et al, 2019, Morris et al, 2022, Borhany, 2018
Grey Literature Organisations	• Living Well With Pain • Arthritis and Musculoskeletal Alliance • 'Flippin Pain'

2.1 Literature Summary

The database literature provides the main findings, with grey literature as a supportive element, providing further insights into existing literature.

In summary, future research is required in order to develop deeper knowledge of CMSK conditions and PA. There is a need to encourage more in-depth study on a wider population group with diverse rather than specific CMSK conditions, to explore aspirations - what do the layers of key motivators for PA look like? There is a need to compare and contrast

intrinsic/extrinsic motivators and explore why instructor-led support is important for motivation for PA, along with condition-coping mechanisms. Based on previous literature on autonomous motivation, little is known about the influencers. This requires investigation. Furthermore, exercise identity (ID) and what thoughts, feelings, aspirations come to mind during exercise, and how this influences PA motivation is important. Lastly greater understanding of CMSK conditions and the feelings associated with barriers impacting on motivation for PA is required.

The following research generated the summary above.

2.2 Exercise Identity (EI) and Intrinsic (IM)/Extrinsic Motivation (EM)

Although many studies (Morris et al, 2022, Ryan & Deci, 2020, Eynon et al, 2019) describe intrinsic/extrinsic motivators, little qualitative research has been carried out, focusing on what assists individuals to carry out physical activity through an emic perspective. Understanding IM and EM would be particularly useful for future public health and health promotion campaigning towards increasing physical activity, specifically targeting CMSK individuals. Focusing on research more generically will help understand some of the reasoning behind the pathway of feelings and thought processes or conceptualisation of motivation during physical activity, alongside the type of motivation used for this group.

This will be applied to Ryan's (2020) SDT model (Figure 1) regarding what motivation is used, based on individual responses during online interviews and will be used as a framework to categorise interview responses into IM and EM which will structure the data interpretation and analysis of the data. Additionally, Figure 1 is a reputable source used universally and will ensure the research analysis is as rigorous as possible in developing a revised SDT model for CMSK conditions.

Figure 1:

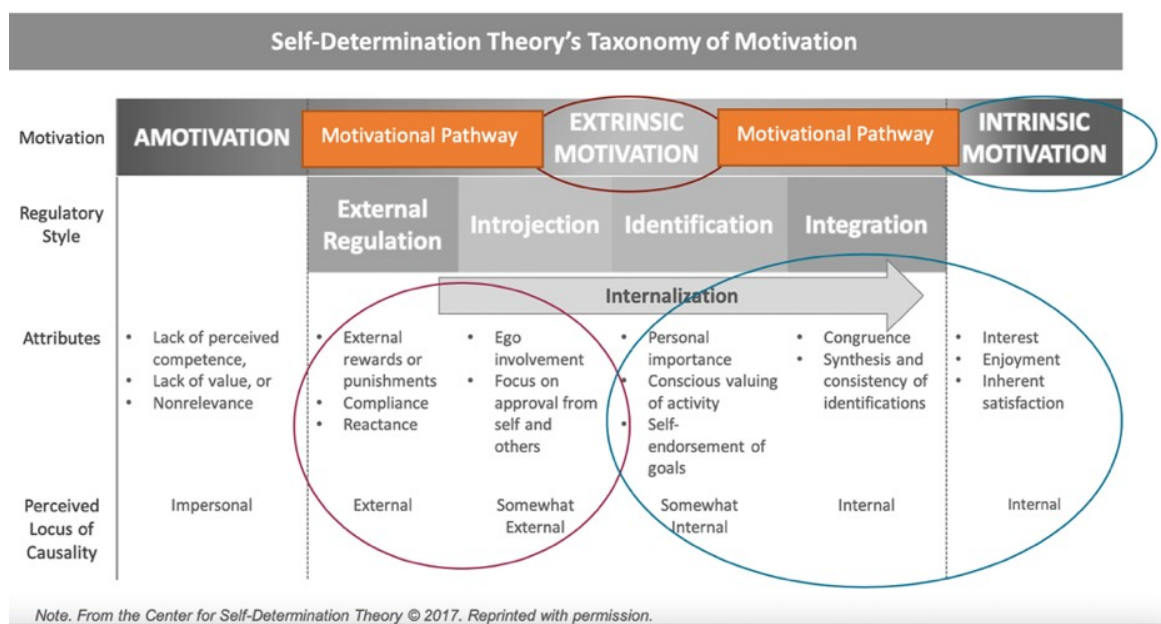
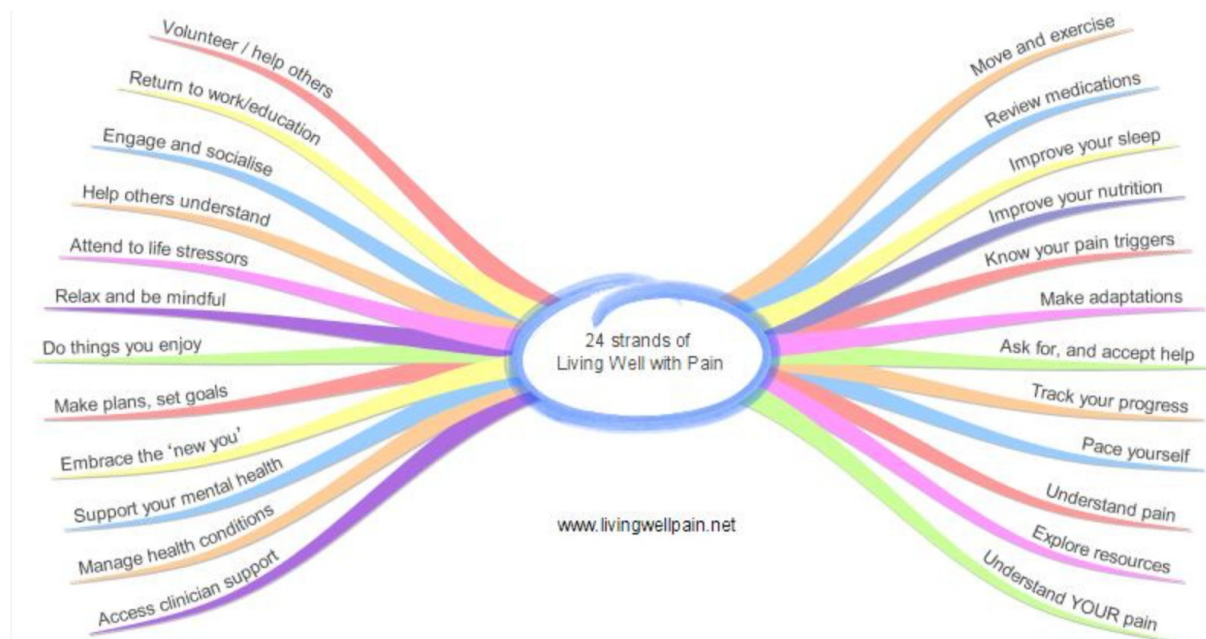


Figure 1 invites exploration regarding common concepts from previous research, allowing the findings of this research to add to an existing knowledge database and motivational concepts for the CMSK group. Using Ryan's (2020) framework provides some standardisation to concepts of IM and EM for categorisation, essential for data quality. Published in 2020 this SDT model is relatively up to date, particularly when linked with Eynon et al (2019) who found that both extrinsic/intrinsic motivation altered during a physical activity session. This is an interesting point generating questions regarding why this changes in relation to ascertaining motivational pathways. Eynon did not significantly explore this and the conclusions reaffirm the existing gaps and the requirement for an up-to-date qualitative approach in that *"research needs to use descriptions of reasons behind taking part in exercise and motivations"* (Eynon et al, 2019).

In support of exercise identity and understanding the reasons behind exercise and motivations, Living Well With Pain provides an insightful guide into exercise including '24 strands for living well with pain' as shown below in Figure 2. Many of these concepts come under the umbrella of motivation, interacting together and separately. This offered the possibility of greater understanding of what could conceptualise motivation.

Figure 2



This figure helped to categorise themes, shown in Table 2.

Table 2

Category:	Qualitative Themes:
'Move & Exercise'	Motivation for exercise-what thoughts, feelings come to mind prior to/after physical activity.
'Understand Pain'	Barriers that affect motivation to participate in physical activity. Can you describe these feelings/thoughts?
'Volunteer / Help Others' or 'Help Others Understand'	Feelings/thoughts associated with exercising alone/does participating in a group help/hinder motivation? Describe why.
'Engage and Socialise'	Engaging and socialising when participating in physical activity-does this help with exercising regularly?

As discussed previously intrinsic/extrinsic elements of motivation factor in this research, by identifying and contrasting feelings/thoughts from the drafted qualitative themes discussed above. As Eynon's research was undertaken in 2016, it would be useful to ascertain if his noted change between intrinsic/extrinsic motivators still correlates, or whether the motivation pathways are more pessimistic for CMSK individuals. Eynon's study concluded, like other qualitative studies the importance of 'exercise identity' (EI), this being "*the extent to which individuals believe that exercise is an important component of who they are as a person*". This concept has only been investigated on one occasion in the exercise referral literature to date, so it was decided to explore EI as a component of this dissertation in terms of semi-structured interviews, exploring associated feelings to understand how individuals conceptualise motivation during PA. The grey literature correlated with the importance of exercise identity. Living Well With Pain (2022) suggested how exercising regularly for CMSK individuals is about '*knowing your strongest motivators*'. These will be explored further.

2.3 Condition Coping Mechanisms (CCM)

Stockdale et al (2014) found additional factors to correlate with motivation for PA. This introduced the concept of '*condition coping mechanisms*' (CCM) which were seen to impact on motivation levels for PA. This is how an individual copes with the challenges of their condition and the findings showed that while instructor-led support was key to motivation levels, those levels declined as a result of coping with daily pain, exhaustion, disease progression and normal day-to-day activities. This decline in motivation and the feelings and coping mechanisms associated with this are explored in this research. Does this still correlate with present CMSK groups?

Referring back to Figure 2 (Introduction p.4), Tier 2 refers to ‘*supervised physical activity*’ known as instructor-led support. This concept of support requires more investigation. The *Chartered Institute for the Management of Sport and Physical Activity* (CIMPSA) produces required professional standards for exercise professionals. The CIMPSA aims are ‘*shaping a recognised, valued and inclusive sport and physical activity sector that everyone can be a part of*’ (CIMPSA, 2023). There is evidently a lack of understanding for CMSK conditions within professional standards. While CIMPSA covers some exercise anatomy and physiology, promotes long-term exercise sustainability and highlights adapting exercise for this group (CIMPSA, 2018), CMSK condition knowledge is inconsistent. It is not something that appears based on current evidence, as a stand-alone subject. The learning content for exercise professionals is over-simplified covering ‘*basic medical conditions, including those applicable to senior health*’ as seen in Figure 3 (Study Active, 2021).

Figure 3

4. Summary of knowledge and skills

Personal Trainer

Topic	Knowledge	Skills
Anatomy, physiology and kinesiology	Human movement/biomechanics, anatomy and physiology including the cardiorespiratory, musculoskeletal, nervous and endocrine systems and the implications of long and short-term exercise on these systems.	Ability to apply appropriate methods and techniques to facilitate clients’ desired physiological goals.
Lifestyle management and client motivation	- The range of factors that contribute to an individual’s lifestyle such as dietary intake, stress, fatigue, alcohol and levels of physical activity. - How to assess clients’ readiness to change their behaviour and how to apply a range of appropriate change strategies. - How to create a positive environment that motivates and empowers clients, promotes adherence to a behaviour change programme and meets their desired goals.	- Assess clients’ readiness to change behaviour and apply effective change strategies, communication techniques and motivation to facilitate healthy behaviours that move them towards their goals and promote programme adherence. - Implement a range of theories relating to client motivation and behaviour change.

Why aren’t CMSK conditions already covered as standard alongside ‘*anatomy, physiology and kinesiology*’ or ‘*lifestyle management and client motivation*’ particularly as one of the outcomes is the ‘*ability to apply appropriate methods and techniques to facilitate clients’ desired physiological goals*’? (CIMPSA, 2023). As CMSK conditions are prominent throughout society, surely this could be catered for more adequately within professional knowledge. This research will provide valuable emic individual experiences of motivation/exercise, aiding greater understanding of exercise environments from a CMSK perspective, along the lines of the Chronic Care Model, whose aim is,

“to transform the daily care for patients with chronic illnesses from acute and reactive to proactive, planned, and population-based” (Coleman et al, 2009),

Despite best efforts of multi-agency organisations to collate a ‘*systems thinking*’ approach to supporting and improving MSK conditions within the UK, there are still many challenges regarding advice/guidance for this group. Public Health England (2019) has launched a ‘*5 year strategic framework for prevention across the life course*’ in which there is consensus relating to ‘*primary prevention*’ because

“Comprehensive patient...outcome information, ...on work and quality of life is not routinely available for most MSK conditions”.

The European Agency for Safety & Health at Work (2017) expand regarding workplace issues that there is a requirement “*to be 100% fit*”, with the affected person feeling that they have lost their ability to work; lack of knowledge in workplaces about chronic MSDs and how to support sufferers and “*lack of disclosure of symptoms/difficulties with work on the part of the worker; and poor communication between worker and employer*” (European Agency for Safety & Health at Work, 2017).

The Kings Fund (2022) corroborates this, defining CMSK health inequalities as “*..avoidable, unfair, systematic differences...*”.

Why is this so? Perhaps this research, although specifically looking at conceptualisation of motivation for exercise, could provide some insight into what works better for the CMSK condition population, particularly in relation to existing barriers and health inequalities.

Many working with Public Health England share common goals in this area. However, the data available is mostly quantitative. The benefit of qualitative research to provide more understanding of the affected population’s needs has been acknowledged but is currently under-utilised. As Shelton (2021 p.28) informs,

“Capturing and elevating the experiences of the people...most affected by health inequities, are the least represented in research, qualitative data moves beyond a reductionist view toenhance the likelihood that identified solutions are acceptable, appropriate, and sustain-able within the communities they seek to serve”.

Shelton (2021) brings qualitative insights into current issues for CMSK individuals, supporting the benefit of this approach by addressing and providing further information into areas of the Chronic Care Model, particularly regarding health inequalities.

As the Taxonomy of Motivation Model or SDT (Ryan et al, 2020) has explained, motivation is key to all aspects of life,

“The motivation of the worker is one of the factors that determines work ability....motivation ...identified as a key factor contributing to remaining at work...” (European Agency for Safety & Health at Work, 2017).

Despite this research focusing on exercise, it is important to highlight other public health aspects where motivation can impact on general well-being. The National Rheumatoid Arthritis Society (NRAS, 2017) provides insights into the main barriers CMSK individuals face regarding workplace challenges. These include demanding roles, symptoms, no reasonable adjustments, commuting to work and lack of understanding from employer/colleagues as already mentioned.

Booth et al (2018), introduced another CCM concept, self-monitoring behaviour as helping *‘identify barriers and facilitators to exercise behaviour, in addition to helping motivate positive exercise behaviour’*.

Booth reaffirmed how future research should look at *‘what works for whom’* and the individual factors that are associated with PA activity, to help determine what ways people respond and how they can be influenced, understanding the key concepts of PA motivations on a holistic and individual level.

Borhany et al, (2018) emphasised how technology has highlighted the prevalence of MSK conditions. This dissertation explores the role of technology and aims to gauge the various perspectives of using technology which will be an important contributor to lived experiences and further knowledge.

These papers highlighted requirements for future research into,

- Exploring condition coping mechanisms (CCM) and what this can feel like on motivation for PA.
- Comparing and contrasting intrinsic/extrinsic motivators.
- Understanding exercise identity (ID) – what thoughts, feelings aspirations come to mind when you exercise, and how this influences PA motivation.

The grey literature complemented insights (Booth et al, 2018) into how individuals can be influenced and *‘what works for whom’* regarding PA, their CCMs and mind-set shift as the extract below highlights,

“I started to do things that I enjoy, rather than doing things with the aim of stopping the pain and my mindset shifted. At the climbing wall, the focus was never about pain, it was about how I could get where I wanted to be. Movement is definitely part of my medicine, the one thing I’ve realised is that where my mind goes, my pain goes” (Laura, Flippin Pain 2022).

Laura highlights enjoyment rather than pain as the main focus. This enabled further thoughts about feelings associated with enjoyment and how they influence motivation.

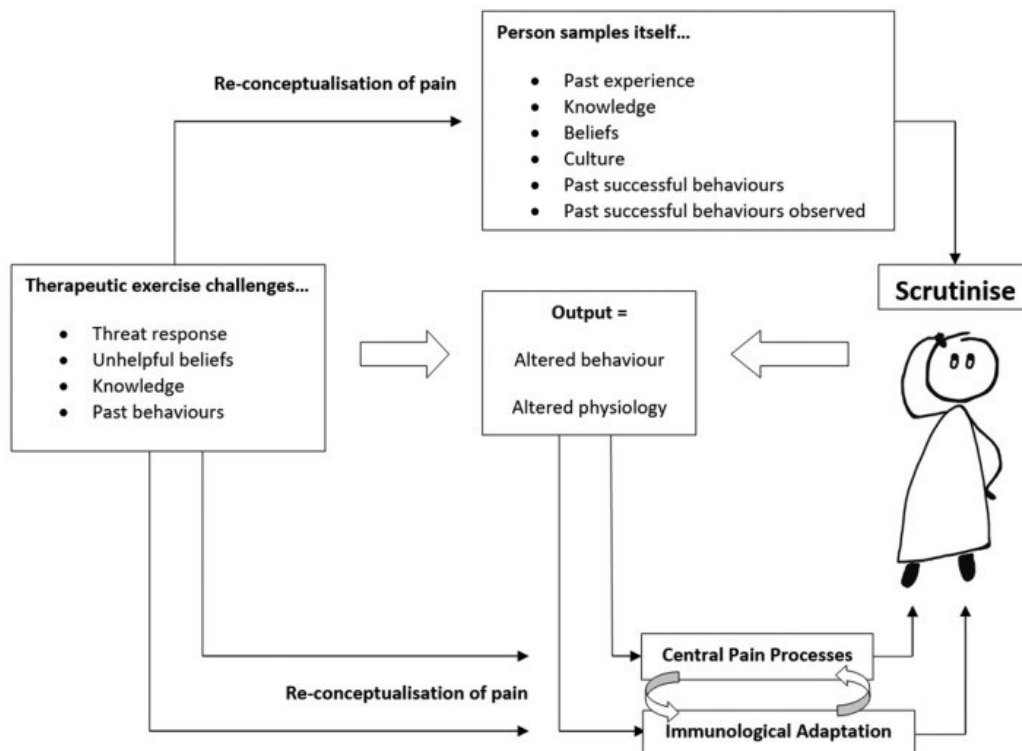
Stockdale's study (2014) is limited in that all individuals participating had the same CMSK condition and were in a hospitalised environment, receiving medication. It is likely that due to the complexity of motivation, the findings and individual responses may have been influenced by environmental factors beyond their control. For example medication, routine and general individual morale are important to consider. It will be interesting to see whether similar themes relating to motivation occur within a population with diverse conditions.

Such studies are currently minimal in the literature explored. Kibblewhite et al (2016) reaffirms the reason why we need diversity, finding that not all exercise was enjoyable. All had different motives for exercise, but having not been explored in detail, a valuable opportunity was missed.

2.4 A More Holistic Approach

Smith et al (2019) acknowledged how a more holistic approach should be taken into how exercise makes individuals feel, rather than a biological tissue strength and conditioning-focused approach. Smith devised Figure 4, exploring thoughts, feelings and behavioural processes, reaffirming the multifaceted and complex nature of CMSK conditions, impacting on motivation levels. It was disappointing from a qualitative research perspective, that these factors were not explored in any depth and only theorised.

Figure 4



The broader the population in terms of the types of CMSK conditions, the more representative the individual perspectives are. This is important in qualitative research, especially when a topic area has limited research, and some undefined concepts as Cohen (2001) states:

“Qualitative research with diverse populations is useful when little research exists..., when there are no reliable and valid instruments.... and when the appropriate language...and questions to ask are unclear”.

Gaskell et al (2018) looked at motives during an exercise class for CMSK members, concluding that instructor-led support was a key component of motivation. It would be interesting to understand the underlying reasons why. Similar to Stockdale et al (2014) the study only focused on the same CMSK condition rather than a diverse set of conditions. These two studies reaffirm the need for future research to focus on a population group with diverse CMSK and explore further why instructor-led support is important for motivation for PA for CMSK individuals.

2.5 Autonomy, Relatedness and Competence

Ji Rung Wu et al (2021) introduced ‘*autonomous motivation*’ as key to PA participation. The main finding was that relatedness was associated with autonomous motivation for willingness to participate in PA. Relatedness, discussed previously and as part of the ‘Taxonomy of Motivation Model’, is complemented in other studies, for example, ‘*exercise identity*’ and what participating actually means to the individual, i.e. a feeling of belongingness with others. Throughout the literature this seems to be a key driver for motives for CMSK participation. Again, it will be interesting to see whether relatedness still correlates and has an impact on autonomous motivation to exercise.

Furthermore, Vansteenkiste et al (2020) found that individual behaviour can be regulated through satisfaction/frustration of three basic psychological needs of autonomy (feeling ownership of actions), relatedness (feeling connected to others) and competence (feeling capable to operate effectively).

This was particularly useful as it correlates with the research findings discussed. Seeing these groups mentioned allowed some consideration as to how to categorise themes and how these will assist in collating themes for the TA methodology. However, it was interesting that none of the other studies mentioned the frustration of the three psychological needs and focused more on the positive elements of these during physical activity for CMSK individuals. Perhaps the reason why the frustrations have not been mentioned within other studies except Vansteenkiste et al (2020) is that there is limited information from a qualitative perspective. Vansteenkiste et al (2020) reaffirmed the three categories discussed previously in the literature review, relating to ‘*a need-supportive environment*’ and this was a key predictor of the type of motivation used, either extrinsic or intrinsic. A need-supportive-environment is defined as where

"...the individual perceives adequate support for making choices (autonomy support), for challenge and growth (competence support) and for being cared for and accepted (relatedness support)" (Vansteenkiste et al (2020).

Furthermore grey literature identified a contradiction to developing a supportive environment in that after investigating professional standards for qualified exercise professionals by the *Chartered Institute for the Management of Sport and Physical Activity* (CIMPSA) it is clear that there are gaps in knowledge relating to catering for CMSK clients.

It was apparent how limited the information was for CMSK individuals in relation to exercise guidelines and personal insights into physical activity participation. For example, although NHS resources provide information on CMSK conditions, many offer only exercise at home guidance which is generalised and therefore of limited application.

Much existing information does not provide personal insights into CMSK exercise, resulting in impersonal provision, rather than looking at the subject matter *"through the eyes of the culture that is being studied"* (Willis, 2007 p.100). Additional information about what has motivated/created barriers and how they have addressed these would provide more meaningful information, reaffirming a requirement for this research to explore these aspects and to gain better understanding.

The Center for Disease Control and Prevention (2022) outlines two principles for supporting exercise inclusivity:

1. Promotion of equal access to opportunities for optimal health;
2. Increasing the quality of life for people with disabilities.

An example of health being multifaceted was evident during the 2020 Coronavirus Pandemic during which poor mental health impacted physical health, social relationships and vice versa, in addition to other factors such as economic. As the British Medical Association (BMA) states:

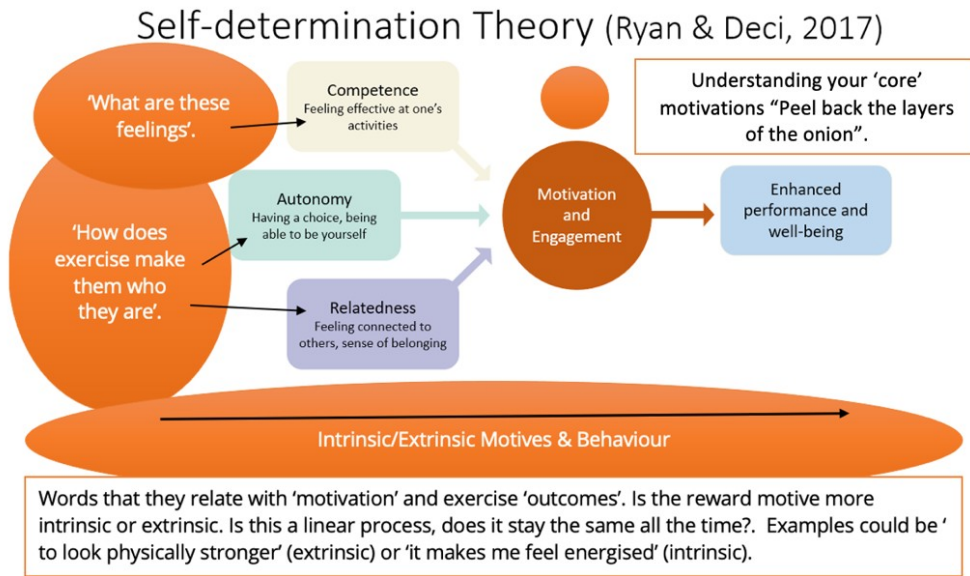
"Beyond its immediate impact on the physical and mental health of the population, the pandemic has also affected many wider determinants of health, including education and employment" (2022).

This demonstrates the complex interactions between a disease and the wider determinants of health inequalities.

2.6 What is Motivation?

Maslow's Hierarchy of Needs (1987) states that the majority of behaviour is *"multi-motivated in that any behaviour tends to be determined by several or all of the basic needs simultaneously rather than by only one of them"* (McLeod, 2018). It is clear, therefore, that motivation is a complex process. Figure 5 below illustrates the processes relating to exercise and motivation, encompassing many factors discussed here, adapted for this research question.

Figure 5



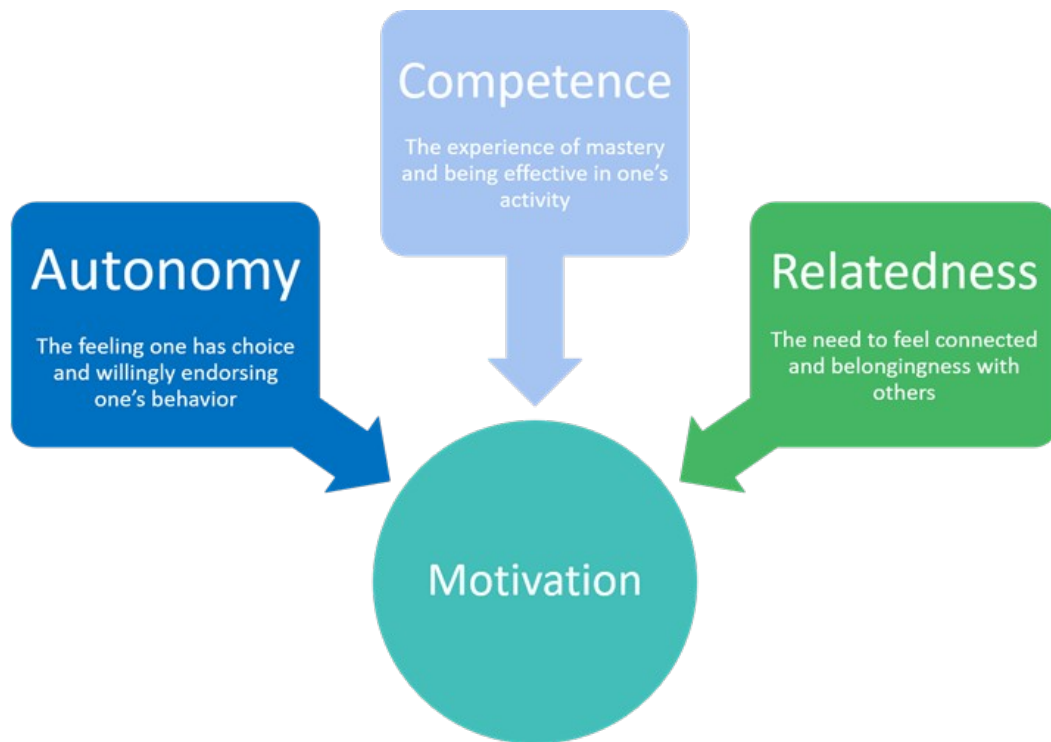
(Adapted, Emery 2022)

2.7 Why the Taxonomy of Motivation Model? The Full Picture

Deci & Ryan's (2017) Taxonomy of Motivation Model or 'Self Determination Theory' (SDT), has played a significant role in understanding motivations for certain human behaviours and has provided the basis of motivational-based knowledge.

This theory is standardised and its application limited to specific populations. It comprises three elements of '*optimal functioning, human motivation and personality*' and reaffirms how they work intermittently to influence how we function (Ackerman, 2023). As the SDT theory has provided the foundation behind motivation, it is applicable to this research. Additionally, the validation for its application is based on it providing motivational theory insights within a variety of settings (Ryan et al, 2020). Furthermore, the SDT model advocates the important role of intrinsic/extrinsic motivation. The theory collates competence, relatedness and autonomy as key components of motivation in relation to social psychology as per Figure 6. In short, '*autonomy, competence and relatedness are considered universal determinants of wellbeing within the framework*' (University of Edinburgh, 2019).

Figure 6:



(University of Rochester, 2022)

There has been little revision of the SDT model, based only on organisational need, for example, within education and sport psychology, rather than for specific groups. The reason for this is not entirely understood, however perhaps education and sport are well-recognised fields, seeking to invest in understanding the concept of motivation to benefit organisational and personal reputation as, *"motivation is significant for academic performance since a student will never make an effort to learn without it"* (Hanif, 2021).

Physical activity is undoubtedly a task requiring motivation to achieve sustained exercise and benefit from the positive health outcomes (Teixeira et al, 2012). It is interesting how individuals with chronic conditions find the motivation to participate in physical activity from a deeper angle, and what the key factors are to them doing so. Is it individualised, or do CMSK sufferers all have similar ideologies, thoughts and processes helping with motivation for exercise?

Investigation into motivation from a deeper angle requires qualitative research.

2.8 The Taxonomy Of Motivation Model: A Snapshot

Choosing a specific motivation model proved challenging. Some are needs-based and assumptive of the needs of the population, such as McClelland's Human Motivation Theory (Guss et al, 2017) of *'power, achievement and affiliation'* which seemed less applicable than

Deci & Ryan's Taxonomy of Motivation Model (SDT). The SDT model focuses on the three psychological components which produce motive '*relatedness, competence and autonomy*' affording the opportunity to investigate why. It also identifies intrinsic/extrinsic motivation, and is therefore more applicable to this.

Furthermore, this is a macro-theory and contains established techniques referred to as motivational interviewing (MI) alongside the theoretical perspective. Both MI and theoretical perspectives have been applied in health and wider societal contexts, posing important questions (Patrick et al, 2012). The SDT model neatly encompasses exercise promotion and well-being alongside knowledge expansion and mitigating the current burden of disease. As Helen Keller, (Keller, 1957) author and disability rights advocate, emphasised, "*Although the world is full of suffering, it is full also of the overcoming of it.*"

This research will explore what it is about relatedness that makes individuals have increased motivations to participate in exercise, in terms of thoughts, feelings and understanding, unlike the specific studies mentioned (Ji Rung et al, 2021, Gaskell et al, 2018 and Stockdale et al, 2014) that have generated meaningful information, but have not been qualitatively investigated further.

A further two requirements for future research were highlighted:

- The need to explore influencers of autonomous motivation.
- The need to understand CMSK conditions – the feelings associated with the barriers that affect motivation levels for PA.

Lastly, Fenton et al (2020) suggest that interventions targeting autonomous motivation for PA as a psychological

"process of change may have the potential for encouraging PA and improving psychological well-being...."

It is apparent that this research area demands a more qualitative approach for deeper understanding of the elements that make up the "*process of change*" for motivation.

Chapter 3 – Methodology

Methodology covers a number of areas as detailed below.

3.0 Qualitative Research

This takes a,

“Social constructionist stance questioning authentication of facts...In contrast, quantitative is more a positivist paradigm assuming facts are fixed, measurable and identifiable” (McClean et al 2019, p.119).

Qualitative research helps to understand the ‘why’, enabling non-assumptive ideologies and allowing various data to emerge. It is key to providing an ‘emic’ perspective of individual lives. As Ninnemann (2015) explains:

“...emic perspectives strive to recognize and understand the meaning of a concept from within the cultural framework in which it is being observed”.

Ninnemann’s (2015) ‘insider view’ is integral to understanding the experiences of the CMSK population and providing further insights.

Murdoch’s Qualitative Research Guidelines (2022) were useful in determining important protocols, as they related to inclusion/exclusion criteria, sample size, approved analytic programmes and techniques. They also assisted in meeting the principles of justice and ethics for the research group.

3.1 Recruitment & Gatekeeper Access

The recruitment process involved convenience sampling to select the most suitable candidates (Simkus, 2023) and ensure that only CMSK individuals were recruited. Mobilates, a Pilates exercise group for CMSK members was approached and a *Participant Information Sheet (Appendix 1)* was devised. As Patino et al (2018) emphasise:

“Establishing inclusion and exclusion criteria for study participants... is a required practice.... Inclusion criteria are defined as the key features of the target population...”

The inclusion criteria were that only adults with at least one CMSK condition would be invited to participate. Those with severe mental health conditions and/or were prone to severe distress if they were to take part in the study were excluded.

This was explained on the participant information sheet which was distributed via social media by the gatekeeper of Mobilates, to enable minimisation of recruitment bias. Further, using social media via their dedicated members’ page for advertising the research meant that it was accessible to many group members. Because the nature of the study was about

individual experiences, it was important that participants came forward willingly, understood what the study involved and wanted to communicate their experiences.

The inclusion/exclusion criteria enabled sample diversity, affording the opportunity to gain rich data to address the research question, but not so broad as to impact on data integrity. As Hornberger et al (2020) point out,

“The narrowness of inclusion/exclusion criteria has a direct impact on the study’s recruitment and feasibility, while the broadness of criteria can affect the data’s integrity”.

Furthermore, some studies only focused on one CMSK condition, but this study includes a range of CMSK conditions to ensure richer feedback, creating diversity of conditions, while at the same time balancing qualitative protocols and principles to achieve rich individual perspectives.

The participants had more than one CMSK condition as per Table 1 below.

Table 1:

Individual/Gender	CMSK Condition	Approximate Age
Female 1	Ehlers Danlos Syndrome Fibromyalgia Hypermobility	40-50
Female 2	Ehlers Danlos Syndrome Tendonitis Osteoarthritis Hypermobility	30-40
Female 3	Chronic Fatigue Syndrome/Myalgic Encephalomyelitis (ME)	20-30
Female 4	Osteoarthritis Fibromyalgia Back Pain Spinal conditions	50-60
Female 5	Connective Tissue Disorder Tendonitis Rheumatoid Arthritis	30-40
Female 6	Congenital CMSK Conditions	20-30
Female 7	Fibromyalgia Ehlers Danlos Syndrome	60-70
Female 8	Back Pain Spinal Conditions	50-60
Female 9	Multiple Sclerosis (MS) Osteoporosis	40-50
Female 10	Connective Tissue Disorder	30-40

	Hypermobility	
Female 11	Diffuse Systemic Scleroderma Auto Immune System Disease Impacting on Musculoskeletal Health	50-60
Female 12	Osteoarthritis Ehlers Danlos Syndrome Back Pain Spinal Condition	60-70
Female 13	Fibromyalgia Hyper Mobility	20-30
Female 14	Hyper Mobility Osteoarthritis	70-80
Female 15	Tendonitis Congenital Chronic Conditions	50-60

Invasive discussions about participants' medical history were not included.

I already knew some participants from a member perspective and although Horsfall (2021) highlighted the possible disadvantage of participant and researcher being too comfortable, this was more of an advantage because *"building a relationship between the researcher and the participant is integral to all qualitative studies"* (Zakaria, 2010).

3.2 Consent Procedures

Consent forms (*Appendix 2*) were given to individuals who registered an interest in the study using my University of the West of England (UWE) email address. Interviews commenced once consent forms had been returned. They were recorded and verbal consent was also given to cover ethical protocols regarding the interview. A unique identifier (participant 1, 2 etc) ensured that participant identity remained anonymous.

Electronically-signed consent forms were stored in UWE OneDrive for the interview duration. Only I had access to this information, to ensure confidentiality. Participants retained a copy of consent forms for personal reference.

Participants could withdraw from the study up until one month from the date of the consent form being signed.

3.3 Recruitment Sampling

Fifteen individuals, all of whom met the required criteria, signed up for the study. All were female, of various ages. No male participants were successfully recruited. While including males would have afforded sample diversity, it is also advantageous to look specifically at CMSK females from a qualitative viewpoint. On balance, this was both a limitation and an

advantage as explained later. Additionally, there was diversity within the sample regarding differing CMSK conditions and ages.

Unlike quantitative research, adequate sample size remains under constant debate but, based on qualitative literature, fifteen individuals felt a suitable sample size given the complexity of the research question and the demand for analysing each interview in turn, using TA. This was based on the fact that “*studies require a minimum sample size of at least 12 to reach data saturation*” (Vasileiou et al, 2018).

3.4 Methods of Data Collection: Online Semi-Structured Interviews

These included verbal transcription, fifteen online interviews and audio recordings, the main method being semi-structured online interviews, between January and March 2023, each approximately one hour. Geographical location of participants made holding a focus group difficult organisationally and logistically. The semi-structured interviews formed the basis of TA, looking at phrases, sentences and deeper meanings. The rationale for online interview, rather than other methods, was greater efficiency of collecting deeper and more confidential individual experiences.

As Figure 1 below shows, online interviews - Zoom and Microsoft Teams - have been approved for use in qualitative research since 1st March 2022.

Figure 1

<i>Description</i>	What is approved?
<i>Methods of data collection</i>	Researchers can use the following: ▪ approved platforms: Teams (Office 365), Zoom. ▪ Only MCRI-allocated Zoom/Team (Office 365) accounts may be used. Personal accounts must not be used. ▪ approved hard disks (including USB sticks- see comments). ▪ approved devices (see below).

(Murdoch’s Research Institute, 2022)

It made sense to use Microsoft Teams which is commonly used in the NHS and has good transcription accuracy “*we promise 99% accuracy for Microsoft Teams meetings on your high-quality audio, whereas automatic transcription applications can only deliver 55-75%*” (TP Transcription, 2022).

Additional interview questions were added to explore emerging issues. These were added with assistance from the Gibbs Reflective cycle, discussed on page 32 (Appendix 3).

Key issues highlighted were professional attitudes to participants' CMSK conditions and accessibility.

Online interviews were conducted due to the geographical distribution of participants and their familiarities with technology and online rooms. The logistics of getting to an online room for this group seemed more feasible and was also reaffirmed by Keen et al, (2022) stating that,

"People with chronic health conditionsmay prefer to avoid travelling, or may feel more able to focus in online interviews. It also lends greater flexibility....who may not know how they will feel on the day...".

The benefits of online interviews have been acknowledged despite mixed opinions about the effectiveness of this still premature method within the field of qualitative research, with regard to data richness. Keen et al (2022) state,

"....data elicited via video calls have demonstrated substantial richness to that gained in face-to-face contexts.participant choice regarding the setting in which they are interviewed, provision of clear instructions and establishment of online rapport have facilitated extended elaborations...".

Recruiting fifteen participants may not have been achieved without the use of online interviews and this would have impacted negatively on data collected.

3.5 Data Analysis Techniques

Thematic analysis was used to identify interview themes to capture commonalities between participant responses, proving flexible for qualitative data as, according to SAGE (2019), using this method

"... a researcher can capture complex, messy, and contradictory relationships that prevail in the real world" (SAGE, 2019).

The seven stages of TA, including transcription, reading, coding, searching for, identifying and reviewing defining themes, offered by SAGE Publications (2019) and Braun and Clark (2006) aided analysis of the interview data to create structure, research credibility and rigour.

Braun and Clarke's (2020) Thematic Analysis updated review offered additional assistance relating to shared meanings as opposed to some level of patterned responses. This point was essential in ensuring that participant majority had shared meanings.

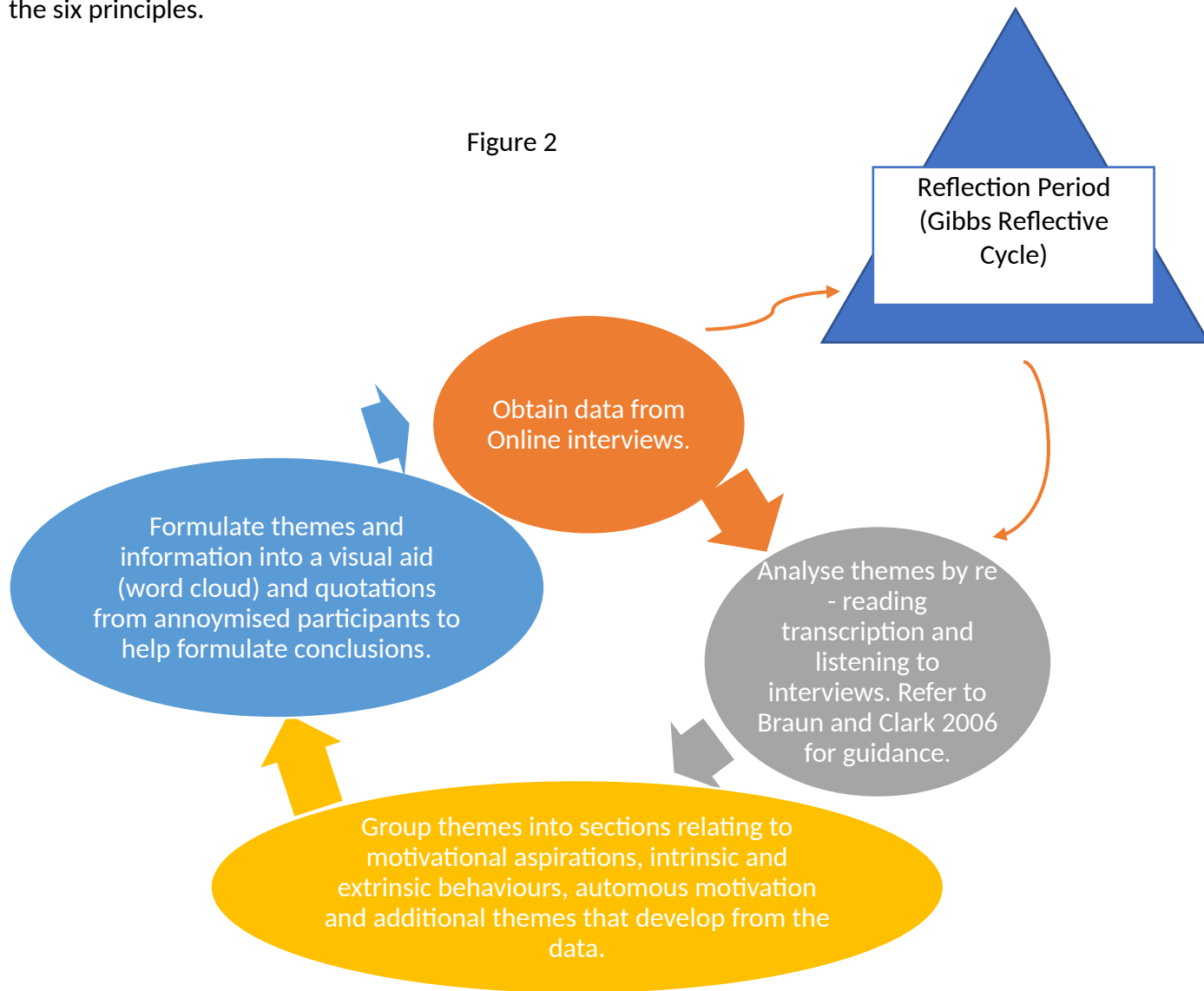
Additionally, Gibbs' Reflective Cycle (2020) was adapted in line with the research question to incorporate analysis, evaluation of the main experiences and building on the interview findings to generate additional questions for subsequent interviews from emerging issues.

Incorporating Gibbs' Reflective Cycle enabled analysis and refinement of questions and development of an action plan for future interviews, as it allows

"looking back on experiences, decisions and actions; recognizing values and beliefs underlying these actions and decisions; considering the consequences and implications of beliefs and actions; exploring possible alternatives; and reconsidering former views" (Sumsion & Fleet 1996).

The data analysis plan below demonstrates each interview having reflection period using the six principles.

Figure 2



3.6 Phase 1: Reading & Familiarisation Using 'Thematic Mapping'

'Thematic mapping' was used throughout but primarily 'data familiarisation' and 'initial code generation'. During the data familiarisation stage, each interview recording was replayed to obtain key messages, alongside the interview transcripts. Re-listening to the audio provided an opportunity to re-live the interview and better understand the responses.



The justification for using visual methodology, is that it adds further richness to the data and is supportive of a participant's perspective which is the core purpose of this research. Glaw et al (2017) are supportive in that,

"Visual methodologies can be used on almost any population...but have been underutilized in health research. Visual methods result in increased trustworthiness of the findings".

3.7 Phase 2: Coding

The transcriptions were revisited to analyse each participant's responses. Under each question, semantic and latent themes were summarised, coupled with possible 'emerging theme ideas' for all participants to help translate onto phase 3 of generating themes.

Coding items is a flexible process in which items are coded/sub-coded many times. Clarke et al (2006) confirm the importance of this to ensure participant responses and specific themes are analysed rigorously, alongside generating semantic and latent themes, as Braun et al (2006) point out,

"...the level at which themes are to be identified: at a semantic or explicit level, or at a latent or interpretative level. A thematic analysis typically focuses exclusively or primarily on one level".

While both are relevant to conceptualisation of motivation, the Semantic involves not looking for deeper meanings, whereas the Latent look for the deeper meaning as Braun et al, 2022 confirms, “....examine the underlying ideas, assumptions, and conceptualisations”

Table 2, below, shows an example of data coding.

Table 2

Data Extract: 1	Coded For:
“Loads. Not very co-ordinated being the fat girl in the class, so turning up to an exercise class and being the biggest person in the class is very hard. Biggest barriers not understanding the health conditions and doing things that are unsafe” (Participant 5).	1. Semantic: Didn’t adapt the exercise for the health condition. 2. Latent: Lack of understanding or awareness, feelings of embarrassment, societal stigma, lack of inclusivity and relatedness. 3. Emerging theme ideas: Lack of relatedness, societal stigma, inequality.

During the process of coding, extrinsic/intrinsic motives were identified with reference to Deci and Ryan’s (2020) SDT model and elaborated in the discussion chapter.

3.8 Data Quality

To ensure additional rigour, the coding of transcripts and emerging themes were consolidated into an emerging ‘code book’ to ensure nothing was missed. The code book was reviewed and amended multiple times (Appendix 4). The code notes corresponded to the data collectively from the individual coding extracts, as per Roberts et al (2019).

“A codebook contains code names and definitions... to allow consistency in coding across interviews and thus ensure quality data analysis”.

Forero’s (2018), ‘Four Dimensions Criteria’ were employed to align research data analysis, to establish trustworthiness. Forero explained that “these are stringent criteria...,credibility, dependability, confirmability and transferability” (Forero et al, 2018).

1. Credibility – “To establish confidence that the results... are true, credible and believable”. The semi-structured interviews enabled generation of meaningful conversation, ensuring that all participants’ perspectives were taken into account and analysed appropriately.
2. Dependability – “To ensure the findings...are repeatable if the inquiry occurred within the same cohort of participants, coders and context”. Using online interviews renders the research repeatable.

3. Confirmability – “To extend the confidence that results would be confirmed or corroborated by other researchers”. The data collection and analysis process is explained in detail to enable future replication.
4. Transferability – “To extend the degree to which the results can be generalized or transferred to other...settings”. Although this sample size is limited, the research question can be applied to other population groups.

3.9 Phase 3: Searching For Themes

Themes were derived deductively, adding nuance to the three SDT areas of

relatedness – “the need to feel connected” competence – “the experience of being effective in one’s activity” and autonomy – “the feeling one has choice”

This is not uncommon practice in qualitative research, enabling a theoretical framework that supports existing knowledge. As Collins et al (2018) emphasise

“Currently, the use of theory in qualitative approaches has included (1) clarification of epistemological dispositions, (2) identification of the logic behind methodological choices, (3) building theory as a result of research findings, and (4) a guide or framework for the study”.

Point 3 and 4 are particularly relevant and will be discussed in the findings chapter, as also will the new themes, identified via the sub categories of relatedness, autonomy and competence.

3.9a Storage Location

This research used the UWE One Drive system to store information, as per the data management plan (Appendix 6), relating to interview guides, participant consent forms and Word documents containing transcriptions from online interviews. All communication with participants was via UWE email, including sending a Microsoft Team’s link for online interviews. Word documents were named Motivation & Exercise Chat 1, 2 etc to ensure anonymity. These documents were only accessible to researcher and supervisor so that confidentiality is maintained. Using Murdoch’s Research Institute Document (2022) as a guide, the One Drive System was approved for qualitative research purposes as Figure 4 informs.

Figure 4



Description	What is approved?
Storage location	Data must be transferred to the following: MCRI-approved and hosted data collection platforms (some research groups might use their own purpose-built systems for data collection)

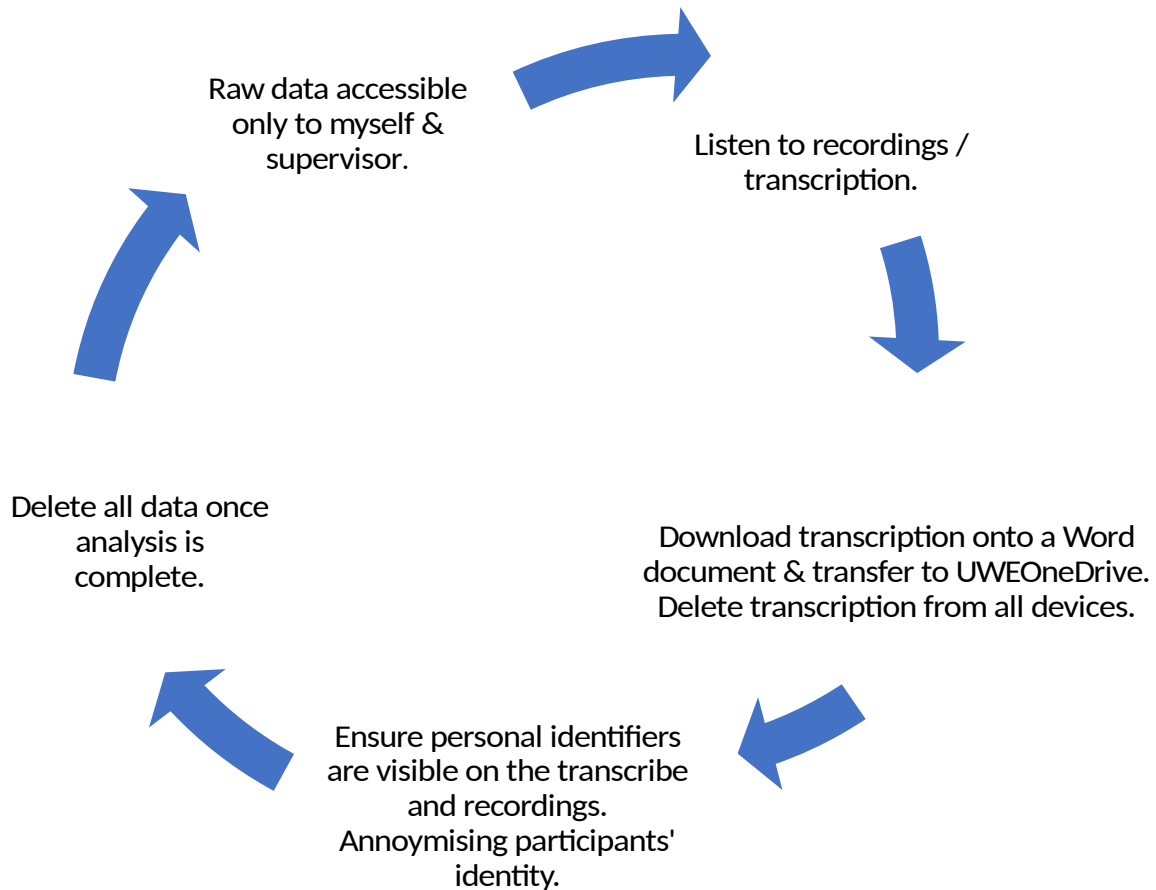
(Murdoch's Research Institute, 2022)

3.9b Data Disposal

Raw data was deleted when recordings had been listened to and transcriptions uploaded to a Word document and saved to the UWE One Drive. Participant identification was only known during the interview process. The Word documents only contained transcription text and erased any personal identifiers of the participants. Entire data was destroyed from the OneDrive once data analysis had taken place and the results had been written up. An appropriate expiry date was set for the recordings to expire in line with the dissertation submission date, allowing a 'buffer period'. All data and personal information were anonymised.

A cycle of the process of data disposal for this research was devised in Figure 5, to ensure UWE ethical guidelines were adhered to at all times.

Figure 5



3.9c Ethical Considerations

There was a possibility that participants could become distressed when talking about their CMSK condition. Some questions could trigger unexpected emotion. If severe distress was caused, the interview was terminated. The focus of the interview questions were on motivation for exercise, in line with the research question. Interviews were semi-structured, inviting individuals to discuss issues in depth, this being a natural characteristic of qualitative research between participant and researcher, but as McClean et al (2019) point out,

“The intimacy afforded through this process...brings...potential risks to both participants and researcher, vulnerability, emotional stress, disclosure that need to be anticipated and managed” (McClean et al, 2019 p.230)

To prepare for this, a high/low checklist was devised prior to commencement and ethical approval was granted (Appendix 5).

3.9d Organisational Signposting

To mitigate potential distress, signposting to support services was devised, choosing only appropriate organisations with a valid reputation and offering ease of access via various digital platforms and covering a large geographical area. However, as previously stated this research is deemed low risk.

Overall, the methods selected for this research and the necessary protocols have been implemented to ensure the research is conducted effectively, adhering to all ethical guidelines set out by the University.

Chapter 4 - Findings

The Taxonomy of Motivation Model or Self Determination Theory (SDT) components of relatedness, competence and autonomy were used to tailor the research findings. Using this model as a framework ensures this research builds on existing theory which is important for knowledge progression, as Leeming (2018) highlights

"....theorisation is a key way in which.... findings lead to knowledge development and are transferred to different contexts, informing practice".

Relatedness was central to how individuals perceived motivation for participating in PA. Although this collated different theories, as the sub-themes show, it was evident this was a key motive and important to CMSK individuals, when one considers the following comments.

4.0 "You're with Your Tribe"

Participants clearly felt that participating in PA with individuals who were 'alike' influenced motivation to participate. The camaraderie between CMSK individuals during the class seemed to influence the conceptualisation process, although individuals described this theme in various ways,

"So you don't feel like the odd one in the room. Everybody's got their own different problems and quite often those are kind of mentioned throughout the exercise. If someone can't particularly, ...cope with something...do it slightly differently. I feel like you definitely belong in the right place. You're with your tribe" (Participant 3).

"I definitely enjoy the community side and the chat...being part of a group, even if we're not all in the room together, you do feel a sense of being part of something and sharing something and hearing the other people. For the user, letting them down as well. OK. It's kind of just a reminder that actually. ..., a lot of people with you have all sorts of issues with their bodies and you get a real sense of achievement" (Participant 11).

4.1 "There Are So Many Setbacks"

Another nuance to relatedness from the interview discussions, was that participants felt that seeing other CMSK individuals progress helped with their motivation for PA. The main factor contributing to setbacks was pain. Participants also highlighted negative emotions as a result of setbacks in other aspects of their lives.

"There are so many setbacks that seeing other people improve and then have a setback of their own just means that you are so much more motivated, because you can see that there is an improvement to be made" (Participant 1).

"You know it's not just the fact that your leg hurts sometimes, and because of that you can't perhaps go and see your friends,....you get very upset and down about it and... it's all that sort of thing." (Participant 9).

It is worth considering whether seeing other people despite setbacks acts as a primary influencer for motivation, to keep trying despite little progress. It also highlights that identifying with others, as the SDT model explains perhaps plays a bigger role than first thought in the lives of CMSK individuals.

Competence, was also a key factor in individuals feeling able to participate in PA and the following interesting themes were generated.

4.2 “The Pandemic Hit Me Very Hard”

The COVID-19 pandemic seemed to be a prominent motivator in attending a PA class for many interviewees, predominantly because of normal face-to-face classes being stopped.

“The pandemic hit me very hard. I shielded. So I didn't leave my home for four months and that left me very unfit and I knew I needed to do something. So I started Tai Chi and then personal training and then Pilates, the three of them together at the same time basically” (Participant 10).

“Since COVID technology's actually probably helping us in a lot of ways. The induction class online I did with the other group I feel like if that was in person, I probably wouldn't have gone. But because it was online that just made me feel more like able to do it and more able to take part...” (Participant 12)

Undoubtedly everyone suffered during the pandemic. However, it is debatable whether the CMSK population suffered more, possibly due to inaccessibility of suitable venues and exercises.

4.3 “All You’ve Got To Do Is Press A Button And It’s There”

Many interviewees communicated how exercise without technology would be extremely difficult and impact on their motivation. Many felt strongly that technology made the difference regarding participation, holding some accessibility life-line.

“It’s mainly that the actual physicality of getting organised and getting myself there...sometimes even just getting dressed is just too much and I know that what we do is okay, because we're going in pyjamas, it doesn't matter.... but for me, it's the sense of I need to show up as best as I possibly can be” (Participant 2).

“...today I did my exercise class this morning, I took a little time to rest and then I've been able to do some of my crafting. Some of my art, and then I've had my vocal coaching and everything else...just wasn't an option when I was having to do exercise classes in person. Zoom, Google and Teams has been a godsend for me” (Participant 15).

4.4 “Reaches Every Corner Of My Well-Being”

Many communicated how being like ‘normal people’ helped them feel inclusive within society and benefited them holistically in all aspects of their lives, not just physically.

“So it's nice to know that I'm doing something however little because I'm housebound. I am doing something towards my health goals. ... that's really the main one. I think a lot of it is mental rather than physical for me.” (Participant 2)

"It makes me feel that I'm doing something that normal people do... All my friends go the gym...I feel like I'm doing mine cause now I can have conversations when I'm out for coffee and say no. You know Pilates yesterday or whatever. I feel like I'm again part of a bigger gang in the world if it's normalised exercise." (Participant 3)

4.5 "You're Adapting For Me"

This emerged across many interviews in response to whether instructor-led exercise had any impact on their motivation level to participate in PA.

Exercise professionals lacking knowledge of CMSK conditions and its limitations seemed to influence motivation levels negatively, whereas being led by a knowledgeable, adaptable instructor was considered to be invaluable to motivation.

"Even people who are willing and knowledgeable, might not understand the full implications of asking somebody to do a repetitive thing. Physiotherapists included... I've seen about 50 million physios over the years and yeah, very willing. Increasingly knowledgeable over the years but they don't quite get how dangerous it can be to do the same thing over and over again" (Participant 1)

"I came out feeling like I was some kind of weirdo, ...my condition wasn't worthy of going into the gym". (Participant 2)

"People don't hear the symptoms that you describe. They think this person's got allergies or this person needs to do more exercise to tighten their joints and this person needs, you know, they don't actually put them all together and actually see..." (Participant 13)

Autonomy/autonomous motivation was the third key factor determining motivation levels. The data confirmed that individuals found more motivation working with others than on their own when doing PA. Many associated working alone with more negative 'reward labelling' in contrast to when participating in a group. Interestingly, some reported how autonomous motivation was dependent on the type of activity. Important influencers were factors such as knowing they were paying for something or enabling routine to their day.

"There's something in my head that goes, I'm paying for this. I've got to do it because I can't afford not to...and that's a bit of a weird thought, but it's definitely been a help..." (Participant 15)

"Well, it depends on the exercise. If it's Pilates happy thoughts. If it's running, not quite so happy...it does depend on the exercise,...I really like because I like the mind and body experience of it as well as the sort of physical benefits I get from it. With something which is really aerobic and high impact. I like it, and then I hate it. I like it when I'm doing it and then it will hurt." (Participant 4)

4.6 “Keeping My Body Moving Is My Prime Motivation” (Condition Coping Mechanisms)

The majority of responses centered around using movement as medicine. The consensus was that there had to be a realistic end goal in relation to their condition in order to continue participating and maintain motivation.

“... distraction of exercise...obviously it doesn't take the pain away and it doesn't stop the pain, but it makes you not think about the pain. So it's a distraction rather than lack of pain. But I find that really helpful”. (Participant 14)

“I think keeping my body moving is my prime motivation because if I stop I'll just get really stiff. ...I just struggle to get back into it without it hurting a lot. I do think about my heart health, but not as much as I think about keeping moving and the mental well-being that comes with it as well, ...feeling of calm being in the zone...I get that with swimming and Pilates just in that little place. That makes me very happy”. (Participant 5)

4.7 “You’ve Got To Find The Greater Pleasure” (Exercise Identity)

Motivation for most individuals was around personal aspirations relating to being able to do more within society and improving quality of life. These intrinsic factors seemed to influence motivation to participate.

“You've got to find the greater pleasure....I would say to anybody else...you've got to do the thing you really love. So if you don't like running or whatever.. don't come to those classes because you're not going to enjoy it. If you know it's not something you'd sort of do and only because a doctor has told you to or something like that, go towards the activity that is naturally where you're drawn.” (Participant 8)

“...it's not like a goal I've got to reach...it's more just a goal to keep going...just be able to manage as well as I can really. It's an important part of my week...” (Participant 10)

The data demonstrates how CMSK individuals set goals which assist with a routine to “just keep going” (Participant 10) to benefit holistic health and well-being.

4.8 “Be Able To Manage As Well As I Can” (Intrinsic/Extrinsic Motivations)

Many expressed similar comments regarding feeling much better after exercise and sharing positive associations of exercise benefits, relating to ‘reward labelling’. This in turn, influences motivational pathways to continue PA participation.

Many also reported that intrinsic were more important than extrinsic rewards for participating in PA, although both played a role. Both types of rewards allowed participants to:

- *“Be able to keep functioning “normally” with a chronic health condition that will never leave me”. (Participant 1)*
- *Be part of a bigger gang in the world, if it is normalised exercise” (Participant 6)*
- *“In general, when you go to exercise classes, they assume you’re fit and healthy... whereas the opposite with this little gang. It’s like the other way round, really. It’s presumed nobody can really do very much, so let’s see what we can do kind of thing, which is very positive , yeah”. (Participant 3)*
- *“one of my biggest reasons to keep,...going back is that having the other people around you saying, oh, yeah, but have you tried so and so and it’s not just about the exercises we’re doing at the time. You know, there’s all the other stuff that goes on behind the scenes”. (Participant 8)*
- *“Strengthen things a little bit more”. (Participant 4)*
- *“Be something that your body likes rather than something your body doesn't, that's great, you know, because my body very rarely feels like that”. (Participant 5)*
- *“So things like opening jars, opening tricky doors, stuff like that is all quite hard and I don’t want it to get worse, so I’m trying to keep on top of that. But I’ve had that issue for over 20 years. So I think that’s probably a really big motivator”. (Participant 7)*
- *“Be able to function more completely in society and I currently can't work and I can't live independently, so the ability to build independence and build the ability to move back into the work place would be amazing. On a smaller level, it's to regain things that I've lost through my ill health.” (Participant 12)*

Many of these motivators are less about short- term goals and more about prioritising long-term well-being.

4.9 “The Psychological Battle”

Throughout the interviews, the psychological challenges prior to participating in PA were evident. This research has provided rich perspectives of the psychological battles involved, and will hopefully help promote greater awareness of this new and unexpected theme.

“I think I always used to feel like my body was in self-destruct mode all the time and I was fighting against that...my body was determined to be fat, determined to be injured and determined to be ill, and all I was doing was fighting,. but I don't think I fight against my body anymore...I kind of accept what I can and can't do” (Participant 2).

“That’s the psychological battle that goes on between... the part of you that feels you’re not worthy and worthwhile and worth looking after...all those kinds of things...the part that wants to look after yourself....then there's the self-sabotaging part that just wants to sit under a duvet and eat chocolate. So it's the battle between those things...” (Participant 13).

This psychological battle appears to be a motivation cross-roads in terms of whether or not to participate in PA. This is an interesting finding which is discussed further within the discussion chapter.

Chapter 5 – Discussion

This chapter synthesises the literature review and research findings, building on existing knowledge.

The multifaceted concept of the themes from the findings needs to be emphasised in this section. They were a priori constructed based on theoretical links between the SDT model and the research question. Although this was a more deductive approach to constructing themes similar to framework analysis, it was the best way to utilise the data and ensure the research question was answered based on findings, As, Bingham et al (2022) advises,

“Deductive analysis can help you maintain focus on the purpose of your research and deductive practices can also help researchers to apply theory or conceptual frameworks”.

It is important to recognise how each theme is intertwined to produce conceptualisation of motivation or as Deci and Ryan (2000) referred to in the SDT model, to help influence the ‘three basic psychological needs’ - the what and why of goals. This is the reason why they are presented as the stand-out themes for this section. Previous literature has identified ‘research needs to use descriptions of reasons behind taking part in exercise and motivations’ (Eynon et al, 2019). This research endeavours to do likewise, the stand-out themes below being:

5.0 “The Pandemic Hit Me Very Hard”

Kloss (2022) identified the pandemic theme as having “significant negative impacts on pain treatment accessibility and function, alongside mental health”, perhaps even more than already acknowledged, with limited data still available.

One of the main criticisms from Versus Arthritis (2022) was that prior to the pandemic,

“Data available on quality of life and work was not readily available... often overlooked the needs of people with musculoskeletal conditions and frequently underestimate the benefits of physical activity for this population. This is not only inequitable but deprives large numbers of people of the opportunity to enjoy better musculoskeletal health.”

These findings identified the pandemic as a dominant influencer on motivation for PA participation. Although individuals communicated their difficulties, many identified the pandemic as an opportunity rather than a barrier. Many interviewees communicated how, when face-to-face sessions were prohibited, they were motivated to seek exercise alternatives. It is questionable whether these results would have been the same if the pandemic had not occurred, but almost every individual mentioned the pandemic in some way as being a starting point or contributor for their motivation. Even individuals who were already members of this research group, communicated that flexibility of the class made them motivated to continue exercise, when accessibility for other exercise was limited.

Furthermore, it appears the pandemic unlocked the motivation for individuals to experience different types of exercise that would better suit their condition. The emphasis on maintaining health and well-being throughout the pandemic may have had some influence in helping them source or maintain motivation to exercise, although this cannot be known for definite. Based on participant comments, the pandemic was a primary influencer in starting the conceptualisation of motivation process in all three areas of relatedness, autonomy and competence. In reference to the Chronic Care Model, the pandemic influenced the community aspect of resources coming together to meet individual needs, but CMSK individuals had the initiative to seek the resources themselves in these desperate times, looking for CMSK-tailored instructors.

5.1 “All You’ve Got To Do Is Press A Button And It’s There”

Throughout the interviews, accessibility proved to be a key aspect to motivation. The flexibility of online exercise classes seemed an importance influence. For some, online flexibility meant they could do other everyday tasks following the session. Furthermore, some individuals communicated how they saw the exercise as an empowerment mechanism to continue through the day and be able to achieve other daily health and well-being goals.

One key factor highlighted was the fatigue of physically getting to a class before even participating in the class. This was an interesting finding as the literature had not explored this technology ‘life line’ context in much detail. From this research it is evidently a motivational pathway instigator for some. Contradiction from some studies such as Borhany et al, (2018) suggests technology has contributed to the prevalence in MSK conditions and is not seen in such a positive perspective.

5.2 “Keeping My Body Moving Is My Prime Motivation” (Condition Coping Mechanisms)

Previous qualitative studies have identified ‘*condition coping mechanisms*’ as influencing individual motivation to exercise, although limited in providing rich perspectives as to why this is. Similar to other research, Stockdale et al (2014) had individuals communicate about daily pain, exhaustion, disease progression and normal day-to-day activities influencing their levels of motivation to participate in physical activity. Booth et al (2018) also identified these ‘*self-monitoring*’ behaviours, which this research has qualitatively gained through interviews. Interestingly, other research communicates condition coping mechanisms in a biomedical perspective, as opposed to what individuals gain socially through exercise. The research findings from this study highlighted ‘*temporary relief*’, ‘*distraction*’ from pain or ‘*being in the zone*’. These findings also show how reliant CMSK individuals are on PA as a coping mechanism, not reported in other qualitative studies. The rich descriptions included feelings of ‘*being in the place, which makes them happy*’. It was clear during the interviews that the individuals identified when they needed to tailor both exercise and pace on a daily basis, depending on their condition.

Previous research interviewed those in medicalised environments, whereas this research collated data outside to gain real-life perspectives. As supported in the literature, ‘*opening up and feeling safe might be easier for people in their own home*’ (Gibbons 2022).

Overall, this study highlights condition-coping mechanisms as holistic rather than biomedical. A criticism of previous qualitative studies is that they focused solely on pain, exhaustion and coping with a condition or symptoms, rather than what physical activity provides as a condition-coping mechanism. These findings emphasise the importance of physical activity as a condition-coping mechanism, although some organisations (Musculoskeletal Alliance 2023) have already acknowledged this. Further research is required to understand what works for whom. These research findings have started to contribute to understanding what PA provides for motivation to sustain exercise, and vice versa (Booth et al, 2018).

5.3 “Be Able To Manage As Well As I Can” (Intrinsic/Extrinsic Motivations)

Analysis of the interview data highlighted ‘*reward labelling*’ as a common theme as did previous research. However, the latter, while acknowledging the complexity and psychological processes of intrinsic/extrinsic rewards for activity as a motivation influencer regarding rewards was lacking in detail.

Many participants emphasised intrinsic rewards were more important than extrinsic, although both played a role. Both types allowed participants to improve their day-to-day quality of life. Interestingly, many of these intrinsic/extrinsic motivators are less about short-term goals, more about prioritising long-term well-being when doing PA. The research findings concluded that sourcing long-term motivators is more likely to result in PA participation and provides insight into the psychological processes. It is also likely that these shift regularly, regarding why individuals want to participate in PA with their condition, with different goals taking priority at different times.

5.4 “Every Corner Of My Well-Being”

Reward labelling is also linked to this theme. Wellness relates to physical, emotional, social, spiritual and intellectual and none of these areas should be neglected (Roger Williams University, 2023). Those interviewed felt that exercise influenced many aspects of their well-being and was key to PA motivation. What correlated throughout many of the interviews was the mind and body experience and how this helped sustain motivation for PA participation.

It seems that for motivation to be conceptualised this ‘*connection to my body*’ is essential more so for CMSK individuals. It is this ‘*connection to the body*’ that enables participation at their chosen levels and management of their condition through exercise which would prove more difficult without this connection. In short, this connection is a key element to their motivational pathway, the how and why they participate and benefit from exercise. This correlates with Flippin Pain (2022) and the 24 strands of living well with pain, for example “*relax and be mindful, make adaptations, do things you enjoy, understand YOUR pain*’.

The formula ‘*Hope, Quality of Life, Confidence = Recovery*’ (Flippin Pain, 2022) raises interesting ideas and debate following this research. It is evident that ‘*connection to my body*’ is the key component influencing all elements of this formula. While ‘recovery’ implies a medicalised stance, enhanced motivation and wellbeing is a more positive and ‘*a more holistic approach*’ (Smith et al, 2019). This is a clear indicator of the need to change the approach to CMSK conditions and confirms the value of qualitative interviews to add deeper understanding of motivation. This would benefit from ongoing review.

5.5 “You’re Adapting for Me”

This theme identified in previous literature, regarding importance of professional understanding of CMSK conditions, was highlighted by participants, who voiced their need to be regarded holistically rather than as a condition. Most interviewees communicated the challenges they faced regarding professional lack of understanding and a limited knowledge

base, making them feel uncomfortable and excluded. What was inspiring was that some of those interviewed researched appropriate instructors who may understand their condition and PA needs, although instructors were limited. This research could be useful in kick-starting an approved CMSK instructor directorate, where appropriate instructors could be certified. However, as discussed previously, CIMPSA accreditation guidelines may need amending prior to this action.

Previous research suggested that being guided through exercise was a key component to motivation but the reason why was not well understood (Gaskell et al 2018), whereas this study suggests that the rapport between instructor and client appeared to be a motivator, although linked with the type of exercise. Some individuals communicated how instructor-led exercise would not work for specific exercise and participants would find it demotivating. Individuals also found that instructor-led exercise was important for their confidence in performing the correct moves, communicating how symptoms of the condition resulted in brain fog, failure to remember what comes next in the exercise routine, another reason why guided exercise increased motivation.

Further CMSK conditions are more than just physical factors. The holistic perspective to exercise needs to be supported to help influence motivation and sustained PA participation, an important point to consider when producing exercise routines for this group. The holistic elements from this research undoubtedly appear to involve PA with an instructor who understands CMSK needs.

Additionally, autonomous motivation is another element under this theme “*You’re Adapting For Me*”. Previous research by Ji Rung Wu et al (2021) found autonomous motivation to be key to PA participation, alongside findings by Vansteenkiste et al (2020) of psychological needs of autonomy including: autonomy (feeling ownership of actions), relatedness (feeling connected to others) and competence (feeling capable to operate effectively). Interestingly the research by Ji Rung Wu et al (2021) is debatable based on the findings of this research where autonomous motivation received a mixed response. Many interviewees communicated difficulty with finding autonomous motivation alongside what type of exercise they wished to participate in. The findings from this research suggest autonomous motivation lying with the individual and a built-in phenomenon of personality, rather than a guaranteed influencer of motivation.

Furthermore, these research findings correlate with those of Vansteenkiste et al (2020) that psychological needs do influence autonomous motivation. From participant responses, it was apparent relatedness seemed to be a prominent influencer regarding class participation, for example attending, (feeling connected with others), paying for the class or planning (ownership of actions) and instructor rapport (feeling capable to operate effectively) were all important. This research has enabled further knowledge of what factors underpin the process of conceptualisation for each of the SDT themes and provided insights into what works for these individuals.

While previous research studies have identified the concept of ‘*exercise identity*’ (EI), this being the extent to which, “*individuals believe that exercise is an important component of who they are as a person*” (Eynon et al 2019), this is the only study to date that contributes

to this. Subsequent themes correlate with EI, in relation to exercise and its importance to the CMSK sufferer. As EI has only been explored in one study, subsequent themes contribute to the developing concept. The individuals interviewed provided rich descriptions of motivation and exercise, generating the following themes, expanding on the concept of EI.

5.6 “You’re With Your Tribe”

Ryan and Deci (2000) state that intrinsic motivation is likely to flourish in environments that support relatedness. However, other researchers suggest there is a need to further investigate relatedness (Gilliand, 2018). In terms of the CMSK population, it appears that this is a central concept to their PA motivation. Further information as to why connection with individuals is important in influencing motivation, stemmed from the interviews in this research and camaraderie, alongside other social aspects were some of the main reasons why PA participation occurred.

What was highlighted from this research was the disadvantage to this population by societal norms in assuming healthiness. This links back to the literature and workplace practice support for those with CMSK conditions regarding employer assumptions for the requirement to be ‘100%’ fit within the workplace (European Agency for Safety & Health at Work, 2019). It is debatable whether these assumptions can be altered in society to better benefit those with CMSK conditions. Perhaps we can assume healthiness but understand that individuals may need support. Many interviewees referred to feeling like a ‘weirdo’ when attending what they would consider ‘normal’ exercise classes. Arguably more research into this issue should be conducted to explore whether this is a generalised issue, or influenced by wider determinants such as geographical location. This research emphasises the requirement for urgent review to understand this on a wider qualitative level.

5.7 “The Psychological Battle”

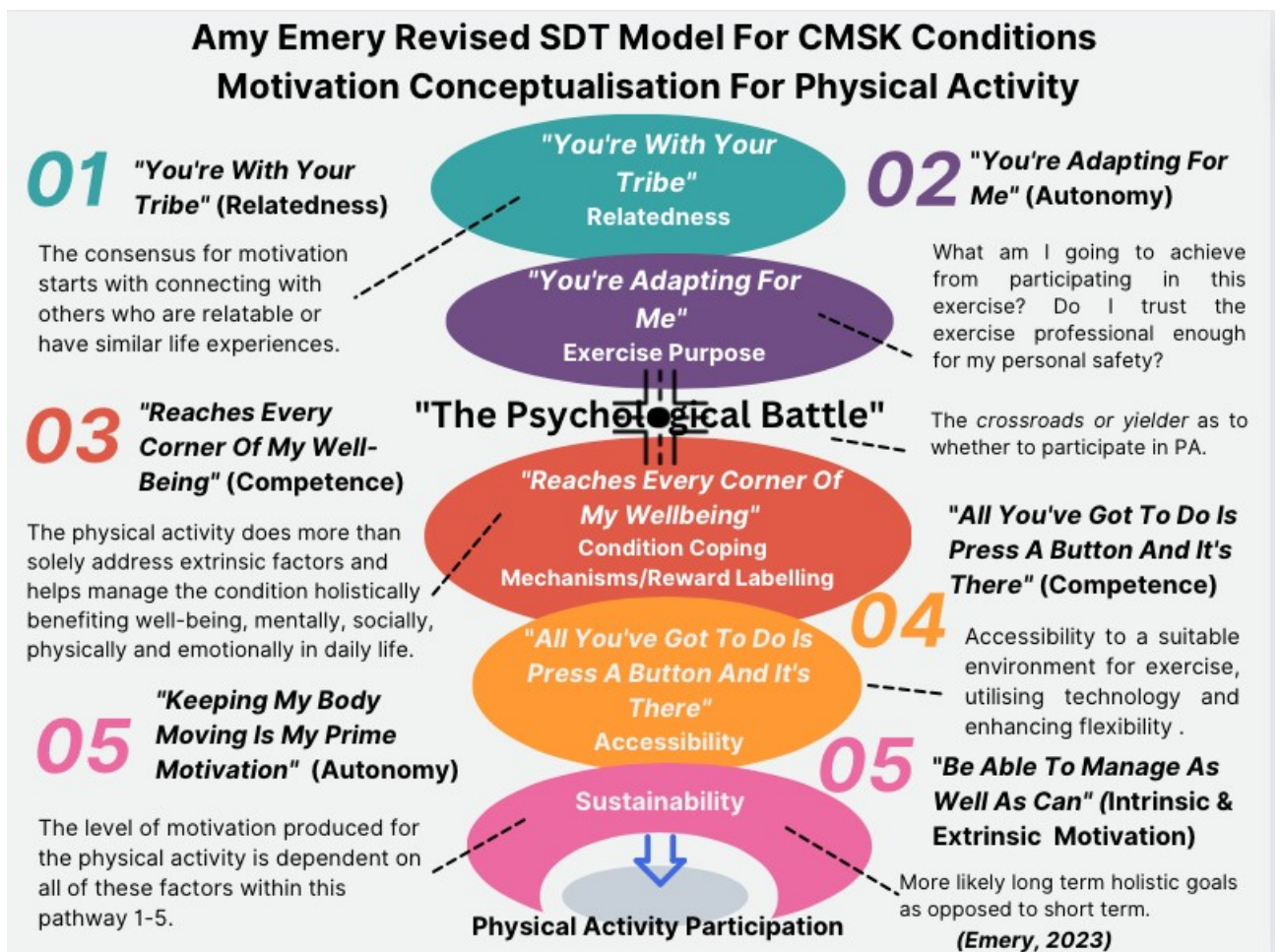
One of the most interesting themes and findings from this research was the ‘*complex loop*’ between mental health and physical conditions which calls for “*targeted preventive strategies and intervention policies for mental and MSK disorders internationally*” (Tyrovolas et al, 2020). However the qualitative insights to this ‘*complex loop*’ are lacking. A key concept for some of those interviewed was the acceptance of what they can/cannot do, alongside when/when not to fight against their body and when to work with it.

The psychological battle is a component of ‘*crossroads*’ for motivation determining whether the individual participates or not. It seems that intrinsic factors such as reward labelling and you’re with your tribe override the components of psychological battles. Based on the interview responses, the SDT model’s components of relatedness, competence and autonomy are both equally affected by and assist in overcoming the psychological battle regarding PA motivation. Many related a battle between the self-sabotaging negative thoughts of pain and fatigue, but the positive aspects of exercise and associated pain management and well-being results in ‘*being in the zone*’. Some interviewees also referred to self-love coming into play, which can be variable for example, wanting to be the best you can be, utilising your body, doing something that your body enjoys, achieving meaningful

goals and ultimately deserving to be the best you can be. The interviewees definitely confirmed that the psychological battle is not a one-size-fits-all approach and is dependent on many influential factors.

As the SDT is a generalised macro-theory, it is difficult to unpick the complexities, without further study to identify any correlation with other CMSK groups regarding motivational conceptualisation and PA. Figure 1, is an adapted, revised version of the SDT model based on the findings from this research.

Figure 1



The revised SDT model is a strong asset in relation to providing insights into motivational pathways for PA, acting as a visual aid to greater understanding. The model's strength is that it can be adapted and replicated for future research purposes as new knowledge emerges.

5.8 Strengths & Limitations

The strengths of this study were that the sample size was sufficient for qualitative research purposes and that participant experiences were applicable to the real world of CMSK individuals. Previous related qualitative studies have had smaller sample sizes (Ernstzen et al, 2016). Additionally, this research is only one of few studies, to date, that has further

investigated conceptualisation of motivation for this under-researched population group. The population group also had multiple CMSK conditions, not merely one condition, or a group of similar conditions as per previous research. This helped meaningful perspectives and an emic lens for a variety of CMSK conditions which has rarely been applied previously. The research participants were recruited from various geographical areas within the UK, helping with equality of participant representation and the research used online platforms to conduct interviews, all of which can be replicated with different groups, to develop further knowledge and personal insights into conceptualisation of PA motivation and the revised SDT model.

The limitations of this research was the over-representation of females in recruitment; no males participated. This may have introduced unintentional bias. The research recruited participants from a single exercise group, familiar with online platforms for PA and may not be entirely representative of other CMSK exercise groups and their views on PA motivation. Lastly, although ethnicity was not acknowledged as it was not felt detrimental to this research, this cannot be accurately determined due to lack of data on participant ethnicity. This should be considered as an acknowledgement in future research.

5.9 Reflective Practice

As a new qualitative researcher this has been a unique, exciting and rewarding process. One of the key components to the methodology has been Gibbs' Reflective Cycle in both the interview stage, TA and for growth as a student/researcher as per (*Appendix 3*). Throughout the research study an 'Interviewer Reflection' component was kept during the interview stage as part of the interview participant topic guide. This was refined during the interview process providing opportunity to achieve both narrative flow and interviewer development opportunities (*Appendix 8*).

The interview guide was essential in making sure the interview questions aligned with the research question, although this did not always ensure that all responses were related to the question being asked. It is important to acknowledge that many of the responses were meaningful and provided some deviant responses arising from issues relating to motivation. Furthermore, the deviant responses enabled interpretation on a micro and macro-level in relation to possible future Public Health practice and policy in Musculoskeletal Health.

Gibbs' reflective cycle also enabled me to grow throughout the research, building and developing confidence throughout each interview. As the interviews went on, my interview style became more fluent and streamlined, although I always felt a strong sense of rapport and empathy with the group. This helped with the rigour and richness of this research and the "*intimacy afforded*" also helped with "*vulnerability, emotional stress to be anticipated and managed*" (McClelland et al, 2019 p.230).

Conducting the research has made me appreciate first-hand the complexities, ethical dilemmas and importance of applying the methodology and also the need to ensure the research is reliable. My supervisor's guidance, along with the Braun and Clarke (2013) thematic analysis book, helped in many areas, to unpick some of the hurdles of qualitative

research. Overall the research aims and outcomes were positive and were sufficiently met to answer the research question.

5.9a Recommendations

The following recommendations from this research should be considered for future implementation to help with further development of knowledge of CMSK conditions:

1. Conduct research from a male perspective (or with higher male recruitment) to understand if the conceptualisation of motivation process is different to that of the female perspective. This would help tailor health promotional PA messaging and provide further insights into motivation conceptualisation.
2. Review existing exercise accessibility platforms and apply a more holistic approach to future public health policy where practical, taking into consideration some of the barriers identified from this primary research.
3. Implement insights from this research, to assist with tailoring health promotional messaging for the CMSK population to encourage PA longevity and sustainability in reference to Emery's (2023) *Theorised SDT model for CMSK conditions* (page 52).
4. Encourage CMSK-linked organisations such as the Musculoskeletal Alliance, Living with Pain, Chartered Institute for the Management of Sport and Physical Activity (CIMPSA) and Versus Arthritis, to work collaboratively to share information and inform future micro and macro public health policy for this population group. All CMSK organisations have a wealth of knowledge, which requires sharing and optimisation to help influence change within the public health system towards a systems thinking approach.
5. Encourage mental health and chronic pain management services to acknowledge the psychological battle and work collaboratively to ensure support services are readily available.
6. Consider future adaptations, highlighted in yellow below in Figure 2 to implement into practice standards, using the CIMPSA framework to accommodate CMSK conditions into working practices.

Figure 2

(Adapted Emery, 2023)

4. Summary of knowledge and skills

Personal Trainer

Topic	Knowledge	Skills
Anatomy, physiology and kinesiology	Human movement/biomechanics, anatomy and physiology including the cardiorespiratory, musculoskeletal, nervous and endocrine systems and the implications of long and short-term exercise on these systems.	Ability to apply appropriate methods and techniques to facilitate clients' desired physiological goals.
Lifestyle management and client motivation	- The range of factors that contribute to an individual's lifestyle such as dietary intake, stress, fatigue, alcohol and levels of physical activity. - How to assess clients' readiness to change their behaviour and how to apply a range of appropriate change strategies. - How to create a positive environment that motivates and empowers clients, promotes adherence to a behaviour change programme and meets their desired goals.	- Assess clients' readiness to change behaviour and apply effective change strategies, communication techniques and motivation to facilitate healthy behaviours that move them towards their goals and promote programme adherence. - Implement a range of theories relating to client motivation and behaviour change.

Anatomy of CMSK conditions and physical limitations.

A basic understanding of living with a CMSK condition and the impacts on lifestyle and exercise motivation.

Chapter 6 – Conclusion

The aim of this research study was to provide deeper understanding of conceptualisation of motivation for those with CMSK conditions during PA. The research study had various objectives which built on previous research and generated new themes which to date (2023) had not been documented previously. The main objective of this research was to generate a motivation theory for CMSK conditions based on the principles of the SDT model

by Deci and Ryan (2000). Although one could argue, that the SDT is a macro-theory, its principles to forming the basis to this research enabled the three concepts of relatedness, competence and autonomy to be understood further, adding nuance to existing theory, for this group. Interestingly it provided acknowledgement of how all three components of the SDT model still apply to motivation, and how the interaction is more complex, specifically in reference to the interview discussions and TA.

The interviews provided personal and in-depth emic insights into the conceptualisation of motivation alongside acknowledgement of barriers and personal passions in PA participation. As confirmed, understanding what works for whom, is essential (Booth et al, 2018). The research has also acknowledged and supports existing theories from previous research in that instructor-led support was key to motivation levels for PA (Gaskell et al, 2018), while also providing more meaningful qualitative explanations which were scarce in the literature. Furthermore, intrinsic/extrinsic motivators from this research have been qualitatively verbalised by those with CMSK conditions rather than reliance on theory alone, or assumptions of what these behaviours may be. The SDT theory was important for categorising and acknowledging examples of extrinsic and intrinsic motivators, but the richness of this study's interview examples adds more insights into this. What is evidently clear is that long-term goals are more meaningful to this population group, rather than vanity or extrinsic motivators such as weight loss, or increasing muscle mass.

Additionally, the Emery Revised SDT Model (2023) provides a visual display specific to the CMSK condition population of how each of the components of relatedness, autonomy and competence from the original SDT theory links with aspects of this population group in relation to PA conceptualisation of motivation and PA sustainability. The benefit of generating this revised model is that aspects can be extensively explored with other PA groups with CMSK conditions which was the ultimate aim of this research. Additionally, it is a model framework translatable for other at-risk minority groups.

Although many of the new themes generated were interesting and invite further understanding, "*the psychological battle*" was the most intriguing. The literature communicated an existing finding in relation to a '*complex loop*' (Tyrovolas et al, 2020). The qualitative interviews of this research enabled a deeper understanding of this loop, the interactions and the acknowledgement of this being a '*cross-roads*' for motivation. It is still questionable whether this is more influenced by personality and the resilience of the individual to battle on despite these psychological challenges, which is not possible to answer definitively. It is not a '*one-size-fits-all*' battle as all battles are individualised for conceptualisation of motivation. This is one of the themes requiring more data in order to influence public health policy and health promotion messaging, to be able to communicate exercise in a way that works and is tailored to the specific needs of the recipient. By emphasising the importance of community and relatedness to PA motivation, along with understanding the psychological battle faced daily by these participants, future health provision could be greatly revised and improved.

Furthermore, this research has enabled reflection on the Musculoskeletal Physical Activity Commissioning Pyramid. The interviews reaffirm the importance of gaining an emic perspective from the individual and the value that this has in providing important

information to influence future public health policy. It undoubtedly emphasises the importance of individual needs becoming Tier 1, the foundation, rather than Tier 4 when many will already have given up the lonely battle.

This research has been a positive contributor to bring to the forefront the challenges faced by the CMSK population regarding PA. It has undoubtedly highlighted admiration for their resilience to battle against the odds, through the complex processes that conceptualisation of motivation for PA entails. The findings also provide meaningful detail of how society still needs to better adapt and support this population in the future, although I feel it is not solely this population group which will benefit. This research is only the 'yielder' to help start understanding the complexities of the conceptualisation of motivation processes for those with CMSK conditions. As participant 1 expressed so clearly, *"I think to forward the kind of aims and aspirations of the chronic health world is always good in my book."* (Participant 1). I hope this research is the start of something better.

Undoubtedly there is more research to be done, to fully understand the process to make musculoskeletal health a public health priority. As reaffirmed by Dame Sally Davies Chief Medical Officer as far back as 2014,

"The tools of public health can and should be used to create an environment where musculoskeletal health can flourish....and those who do have musculoskeletal conditions are able to take steps to reduce the impact it has on their lives".

On a final note, how long it takes for musculoskeletal health to 'flourish' remains debatable, but with further qualitative research utilising the revised SDT model from this research can only support and bring to the forefront this complex public health matter and provide the steps towards better support for the CMSK population.

(14,995 Words)

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Appendices

Appendix 1: Participant Information Sheet

Appendix 2: Consent Form

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Appendix 4: Emerging Code Note Examples

Appendix 5: High/Low Checklist and Ethical Approval

Appendix 6: Data Management Plan

Appendix 7: Qualitative Participant Distribution Data Tally

Appendix 8: Interview Participant Topic Guide

Appendix 1: Participant Information Sheet

Hello 😊

You are invited to take part in student research undertaken at the University of the West of England, Bristol. Before you decide whether to take part, it is important for you to understand why the study is being done and what it will involve. Please read the following information carefully and if you have any queries or would like more information please contact Amy Emery, Masters (MSc) Public Health Programme, UWE, Bristol by emailing: Amy2.Emery@live.uwe.ac.uk.

Who is organising the research?

The student researcher Amy Emery under the supervision of Stuart McClean, Professor in Public Health, Health and Wellbeing. The supervisor's profile is available at <https://people.uwe.ac.uk/Person/StuartMcClean>

What is the aim of the research?

The research is looking at understanding motivation for physical activity for those with chronic musculoskeletal conditions and their experiences. The research questions aim to provide information on 'what motivates you' to do physical activity and the 'lived experiences' with your condition. The study aims to gain better understanding of experiences, so that exercise support can be improved in the future for those with chronic musculoskeletal conditions.

Why have I been invited to take part?

As an individual with a chronic musculoskeletal condition we are interested in gaining knowledge about your experiences for your motivation during a physical activity session with your condition. The virtual interview will ask you about these things. We will not be asking any questions about your full medical history and will only briefly ask you about what musculoskeletal condition you have if you wish to disclose. Your identity will be anonymised for the research study. The purpose of the questions will be to gain information about your motivation for physical activity and your experiences of this with your condition.

Do I have to take part?

You do not have to take part in this research. It is up to you to decide whether or not you want to be involved. If you do decide to take part, you will be given a copy of this information sheet to keep and will be asked to sign an electronic consent form. If you do decide to take part, you are able to withdraw from the research without giving a reason for example: until the point at which your data is anonymised and can therefore no longer be traced back to you. This point will take place a month from the date you signed your consent form. If you want to withdraw from the study within this period, please write to

Amy Emery by emailing Amy2.Emery@live.uwe.ac.uk. Deciding not to take part or to withdrawal from the study does not have any penalty.

What will happen to me if I take part and what do I have to do?

If you agree to take part you will be asked to take part in a virtual interview via Microsoft Teams. This will be conducted by the student researcher. The virtual interview will take approximately 60 minutes, allowing sufficient time to hear your thoughts. The virtual interviews will be recorded using a digital device in order to ensure your thoughts are accurately heard and analysed appropriately.

The subject and focus of the discussion will be relating to your motivations during a physical activity session with your condition, following a series of questions. Your answers will be fully anonymised.

Individuals taking part in the research can ask for copies of their 'transcribed' interview if they so wish and video recordings for a limited amount of time (approximately 1 week after interview).

If you choose to withdraw from the research study:

A unique identifier will be used to re-identify you e.g. 001, 002 if you choose to withdraw from the study within the period. At the point of transcription, your voice/video recording will be deleted. Your data will be anonymised at this point and will be analysed with interview data from other anonymised participants.

What are the benefits of taking part?

There are no direct benefits of taking part but you will be contributing to knowledge which will benefit individuals like you in the future in relation to physical activity and your condition.

What are the possible risks of taking part?

We do not foresee or anticipate any significant risk to you in taking part in this study. If, however, you feel uncomfortable at any time you can ask for the virtual interview to stop. If you need any support during or after the virtual interview then the researcher will be able to put you in touch with suitable support agencies. The supervisor is experienced in conducting and supervising the virtual interviews and will support the student to conduct the research sensitively. The virtual interviews have been designed with these considerations in mind.

What will happen to your information?

All the information that you give will be kept confidential and anonymised during the research. You will be identified as Person A, Person B which will only be known to the researcher and no personal names or information will be used. The only circumstance

where we may not be able to keep your information confidential is if the researcher feels your safety is at risk, for example in safeguarding when compelled by law. Hard copy research material will be kept electronically and digital data will be stored on the University's secure OneDrive system to which only the researcher and supervisor will have access, in accordance with the Data Protection Act 2018 and General Data Protection Regulation requirements. Voice/video recordings will be destroyed securely immediately after anonymised transcription. Your anonymised data will be analysed together with other interview and file data, and we will ensure that there is no possibility of identification or re-identification from this point.

To follow the Data Protection Act 2018 this research will comply by deleting information once analysis from interviews has been done and will not store for as long as the information is needed.

Where will the results of the research be submitted or published?

The results of this research thanks to your participation, will be devised into a dissertation which will be submitted in September 2023. This dissertation will be written containing the research findings and submitted to the University. A copy may be displayed in the University library. If you are interested in reading a copy please contact the researcher.

The anonymised results may also be used in conference papers and peer-reviewed academic papers. Anonymous and non-identifying direct quotes may be used for publication and presentation purposes.

Who has ethically approved this research?

The project has been reviewed and approved by Stuart Mclean, Associate Professor in Public Health, Health and Wellbeing, Research Ethics Committee if low risk, or [the Faculty [name] Research Ethics Committee, and insert details of any other ethical approvals obtained]" if high risk. Any comments, questions or complaints about the ethical conduct of this study can be addressed to the Research Ethics Committee at:

Researchethics@uwe.ac.uk"

What if I have a concern or something goes wrong?

In the unfortunate circumstances you do have concerns during the research, please contact the research supervisor Stuart Stuart.Mcclean@uwe.ac.uk in the first instance.

What if I have more questions or do not understand something?

If you would like any further information about the research please contact either:

Amy Emery (Researcher) Amy2.Emery@live.uwe.ac.uk

Thank you for agreeing to take part in this study.

You will be given a copy of this Participant Information Sheet and your signed Consent Form to keep.

Appendix 2: Consent Form

How do individuals with chronic musculoskeletal conditions conceptualise motivation following a physical activity session, or intervention and how does this contribute to our current understanding of their motivation pathway?

This consent form will have been given to you with the Participant Information Sheet. Please ensure that you have read and understood the information contained in the Participant Information Sheet and asked any questions before you sign this form. If you have any questions please contact the student researcher or their supervisor Stuart Mclean, whose details are set out on the Participant Information Sheet.

- I have read and understood the information in the Participant Information Sheet which I have been given to read before asked to sign this form;
- I have been given the opportunity to ask questions about the study;
- I have had my questions answered satisfactorily by the student researcher;
- I agree that anonymised quotes may be used in the final report of this study (e.g. dissertation) or in any subsequent publications;
- I understand that my participation is voluntary and that I am free to withdraw at any time until the data has been anonymised, without giving a reason;
- I agree to take part in the research

By providing an 'X' in the below box you are agreeing to take part in this research study and have understood the above information, alongside the participant information sheet provided in addition to this consent form.

If you are happy to take part, please **tick** the box in the square below which should become an 'X'.

☐

You will be given a copy to keep for your records.

Please confirm your name below on the dotted line and the date:

Name (Printed).....

Date.....

Appendix 3: Gibbs Interview Reflection

Chat 1

Gibbs Reflective cycle.

Feelings - Exercise provides positive associations between being part of normal society. Benefits included, tailored accessibility to exercise and appropriate instructor rapport, trust.

Evaluation - Negative associations were pain, fatigue on a general basis, but the positive association of PA enabled them to have the motivation to want to participate. Reward seemed to be key, both mental & physical rewards to the participant to participate.

Conclusion - "Added question" emerged regarding lack of health professional understanding. This is something that needs to be explored further in subsequent interviews.

Key takeaways included

- Pain & fatigue was a barrier to exercise.
- Instructor rapport is essential to motivation for PA.
- Mental & physical reward work closely together to influence motivation for PA.

Action plan - ◦ Next steps - mention and explore instructor rapport & health professional understanding further and identify more motivators for PA in CHSK condition population.

Appendix 4: Emerging Code Note Examples

Participant 7

Possible code:	Description:	Example:
Exploring capability	Discovering what they are capable of with their chronic condition seems to enhance motivation for PA.	"I remember doing a movement and it was just like coding it on to the side and pulling it like that and it put it stretched all the muscles there and I was like, I've never stretched these muscles before. I didn't even know they existed. And after that I thought I realized that I could pick up things like, you know without ".
Exercise is a double edged kind of coin	It's helping multiple aspects of the individuals chronic condition, and with some aspects of management relief.	"So a real a real kind of double edged kind of coin that it's like it's preventing things. But it's also helping things as well. And that is what I really look forward to because at the moment with pain medication, I'm not getting the relief I need".
More than just pain prevention - enhances quality of life (possible code 'well-being branch').	Exercise touches all aspects of the individuals life, and filters through i.e helping social anxiety which helps with motivation to continue.	"It's also helped me socially. So it's not just a kind of thing, but you know, I want to go to prevent as much pain as possible, but it's also something that's helping me learn how to be social again. And as I said last Saturday, the first time I went out socially in years and I really do credit the, you know, doing one or two classes either week for this long."
Routine & Quality of life	Participating in PA has helped motivation in everyday life, and aspects	"To what the end of last year, I managed to get another medication I did to my regime

	of life they would have found difficult. This in turn makes individuals want to continue with exercising.	and it's helped so much with being able to get up kind of. Let's go get up in time. Get up like a decent time, but not just get up, be able to engage and I think having an like 11:00 AM class is perfect for me now because I'm up about nine 9:30 and I can get up. Have a coffee, remember who I am, what I'm doing. No, usually get dressed. And then do my class and then it sets me up for the rest of the day. It gives me that real kind of like, right. You know, I can. I've got good proprioception and engagement muscles we gave my mind. I've spoken to people and then that helps me go out and do whatever it is I need to do."
Variety	Variety of exercises helps with motivation to keep attending the exercise class and participating.	"So having that's why I like it. Well, like doing the with the equipment like the bands and the balls and all that kind of stuff. And you can have different and also just swapping between doing stuff with the arms, stuff with the legs and just changing around, things like that, keeping it interesting, keeping it."
Communicative opportunity/ rapport with instructor	Found it beneficial to have designated time to discuss any issues as oppose to some classes, you don't get that aspect.	"Like it's great that have been classes when they ask you know, is there anything anyone getting to say that's only a problem with anything? And because that way as well I can get out what I need from it. And it's so funny because usually I say ohh you know, ma next really. So everyone's like. Yeah, yeah, yeah"
Exercise professional attitude -	Understanding the purpose of exercise is key to motivation for those with CMSK conditions	"There's no. That's why I'm going to videos. It took me years to actually like, you know, do the stuff they said because

	'why am I doing this'? .	it's like you turn up for five minutes and like, OK, the poke you a bit print out some sheets and send you away for three months. Yeah, that's the reason. What's the purpose? Why am I doing this, you know?"
Gratitude / Exercise Reward Labelling	CMSK conditions are grateful for the adaptability to be able to participate in exercise, but are aware that this is limited).	"I find myself doing like some, you know, some of the strict next stretches in bed or kind of like, you know, doing some things at home, not even in a class because I know that it works and that's. It's sad because I know a lot of people won't get that"

Participant 1

Code:	Description:	Example:
Self-Love	Self – Love and knowing you are worthy influences motivation (perhaps included in well-being branch)?.	“Yeah, management, Control. UM, improvement, Self-care Comes up and yeah. Self-love like they need to actually care enough about myself to do something for us. “
Routine & Quality Of Life	Building independence seems to be important and reflection of progress influences their motivation to want to participate in exercise.	“Be able to function more completely in society and I currently can't work and I can't live independently, so the ability to build independence and build the ability to move back into the work place would be amazing. On a smaller level. It's to regain things that I've lost through my ill health.”
Companionship & other individuals progression / progressive reflection?	Progressive reflection?	“There are so many setbacks that seeing other people improve and then have a setback of their own just means that you are so much more motivated because you can see that there is an improvement to be made”.
Autonomous Motivation “I don't find I get the same endorphin rush’.	Autonomous motivation is more difficult for PA – perhaps with all the other elements, individuals find the motivation to be more powerful with other individuals, ‘ like a stream?’ the more the better.	“Self-motivation if I just need to go and exercise on my own awful, really cannot. It's not something that I enjoy doing. I don't find that I get the same endorphin rush that other people get from exercise, so I don't. There's no kind of fun afterwards. All I have afterwards is the fatigue so the group has place really helps with that motivation, but yeah”.
Exercise Purpose / Satisfaction/ Enjoyment is key (intrinsic motivations over rule extrinsic?)	What benefit are they getting from the PA seems to influence motivation levels.	“Otherwise, doing it, that's one of the best things is that it's always joyful. Everyone's being lifted, no ones being told they're not working hard enough or they're not doing enough. Everything's about. Enjoying yourself? I think that's really important to motivation. “

Your adjusting for me	Someone thinking of suitable adjustments suits many with CMSK conditions and takes the pressure off. This influences motivation to want to do PA. Perhaps there is enough pressure on them physically to come and do the exercise?	"Yeah, really helps my motivation. UM, part of EDS and all the rest of it is I have brain fog, so I like everyone else with chronic health conditions, have been given a very long list of exercises to do by the physio that I could do on my own, but having someone actually talk through an exercise and when I get halfway through doing something can I forgotten what I've been doing? If I'm on my own, I generally just stop because I can't remember I am so, whereas if I'm in a guided environment then it's always someone following on. It also means I don't have to think about all the adjustments for myself. Someone else adjusting for me, which is really helpful."
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Participant 5

Code:	Description:	Example:
Companionship	Key motivator is seeing other people.	"Honestly, initially it's like I can't be bothered and I'm like, I don't know, I don't really want to do this and so I won't do recordings because I can't motivate myself enough to do them. But then when thinking of joining a class where there's a group of people. Umm. I look forward to seeing people. I look forward to the kind of the Community aspect of being in a class where people who are very similar to me".
The CMSK Onion Layers	Connecting with people seems to be the top layer thus far for conceptualising motivation?.	"Connecting with people, 2. Using movement as medicine, 3. Get Stronger, 4. Managing weight."
Long Term Goals (Sustainable health goals?)	Sustainable health goals are more important than short term goals. Chronic health is long term so therefore the goals need to relate to that for the CMSK condition	"To be able to keep functioning "normally" with a chronic health condition that will never leave me". Getting through the class, I'll feel a lot better as a result. So is that. That's the kind of motivation. It's one the looking

	population.	forward to seeing people and then two, it's the knowing that it's good for me."
Accessibility of venue and other factors (extrinsic and intrinsic).	Extrinsic factors do influence, but not solely on their own – intrinsic factors play a role. Perhaps the conceptualisation of motivation is multifaceted?	"It doesn't. Paying for something, getting most from my money, being with people.

Appendix 5: High/Low Checklist and Ethical Approval

UNIVERSITY OF THE WEST OF ENGLAND, BRISTOL
Department of Health & Social Sciences

Does the proposed research fall into any of the following categories?		
	YES	NO
▪ Research involving potentially vulnerable groups – e.g. children and young people, people with a learning disability or cognitive impairment or people in a dependent or unequal relationship.		X
▪ Research involving people who lack decision making capacity. All research that involves people who lack capacity or who, during the research project, come to lack capacity, must be approved by an “appropriate body” operating under the Mental Capacity Act, 2005.		X
▪ Research involving human body parts, human tissues and/or human cells that come under the remit of the Human Tissue Act. http://www.hta.gov.uk/legislationpoliciesandcodesofpractice/legislation/humantissueact.cfm		X
▪ Research using administrative data not in the public domain or secure data. Researchers or research centres using these data sets will need to be approved by the body supplying the data and keep data in secure areas (according to an agreed data management plan).		X
▪ Research involving deception or which is conducted without participants’ full and informed consent at the time the study is carried out.		X
▪ Research involving access to records of personal or sensitive confidential information, including genetic or other biological information concerning identifiable individuals.		X
▪ Research which would or might induce psychological stress, anxiety or humiliation, or cause more than minimal pain or distress to either participants or researchers.		X
▪ Research involving intrusive interventions or data collection methods, e.g. the administration of substances, vigorous physical exercise or techniques such as hypnotism. In particular, this is where participants are persuaded to reveal information they would not otherwise disclose in the course of their everyday lives or within public forums.		X
▪ Research undertaken outside the UK, where there may be issues of local practice and political sensitivities.		X
▪ Research involving respondents through social media and where sensitive issues are discussed (see guidelines on FREC website).		X
▪ Research involving visual/vocal methods, where participants or other individuals may be identifiable in the visual images used or generated.		X
▪ Research which may involve data sharing of confidential information beyond the initial consent given, e.g. where the research topic or data gathering involve a risk of information		X

CHECKLIST FOR HIGH/LOW RISK RESEARCH

Please read through the following sections and indicate your response in the appropriate column.

Answering "Yes" to any question may necessitate the need for further consideration in that area and it may indicate that the research should be regarded as high risk and should therefore undergo the appropriate ethical review processes. Please seek advice from your supervisor should you require any clarification or visit the Faculty Research Ethics site at <http://www1.uwe.ac.uk/hls/research/researchethicsandgovernance.aspx>



School of Health and Social Wellbeing
College of Health, Science and Society
Frenchay Campus
Coldharbour Lane
Bristol BS16 0QY

16th November 2022

RE: Amy Emery
UZVSMT-45-M Dissertation (MSc Public Health)

Title of Project: *How do individuals with chronic musculoskeletal conditions conceptualise motivation following a physical activity session, or intervention and how does this contribute to our current understanding of their motivation pathway?*

Dear Amy,

Thank you for submitting your ethics application. I have reviewed your research ethics application and deemed it to be low risk. This letter confirms that I am able to grant you ethical approval on behalf of the Faculty of Health and Applied Sciences Research Ethics Committee to proceed with your research project. Please ensure you append this letter to your final dissertation, along with any other documentation you will be using during the research.

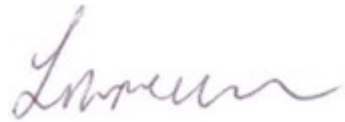
The following conditions apply to all research given ethical approval by UWE:

1. You must notify me (as your supervisor) if you wish to make significant amendments to the original application: these include changes to the study protocol that have an ethical dimension.

2. You must notify me (as your supervisor) if there are any serious events or developments in the research that have an ethical dimension.

The University is required to monitor and audit the ethical conduct of research conducted by academic staff, students and researchers. Your project may therefore be selected for audit by the University Research Ethics Committee.

Best wishes

A handwritten signature in purple ink, appearing to read 'Stuart McClean', is positioned above the printed name.

Dr Stuart McClean, Associate Professor in Public Health
Dissertation supervisor

Appendix 6: Data Management Plan

Data Management Plan Checklist

Adapted from DCC. (2013). Checklist for a Data Management Plan. v.4.0. Edinburgh: Digital Curation Centre. Original available at: <http://www.dcc.ac.uk/resources/data-management-plans>

You should use this template to help you compose the data management questions raised in an ethics application.

CHECKLIST & QUESTIONS	PLEASE COMPLETE ...
Administrative Information	
Project Name: Extrinsic or Intrinsic Motivation. How do individuals with chronic musculoskeletal conditions conceptualise motivation during a physical activity session? Contributing to our understanding of the Taxonomy of Motivation Model. A Primary Qualitative Study.	Amy Emery MSc Primary Qualitative Research Study
Brief Project Description Summarise the type of study (methodology), the research question and the purpose of collecting Data.	Primary Qualitative Research Study Using virtual semi-structured interviews. Research question: How do individuals with chronic musculoskeletal conditions conceptualise motivation during a physical activity session? Purpose of data collection: To provide a 'rich information' perspective of what motivates individuals with chronic musculoskeletal conditions during a physical activity session.
Supervisor's name, phone & email	Stuart McClean Professor of Public Health MSc Programme.

	Stuart.McClean@uwe.ac.uk
Your name & student ID number & email	Amy Emery Email: Amy2.Emery@live.uwe.ac.uk
Date this plan was initiated	2 nd November 2022
Date plan was last updated	N/A
Who is responsible for implementing the DMP, and ensuring it is reviewed and revised?	Student in collaboration with supervisor.
Data Collection	
Describe the type of data you will collect.	Primary qualitative data devised from virtual interviews.
Describe the volume of data you will collect.	Minimum of 5 participants. Volume of data applicable for data saturation for a primary qualitative study.
Describe any existing data or third-party sources you will use.	Microsoft Teams and secure email.
Describe how all your data will be stored, backed up and accessed.	All data should be stored on password protected encrypted UWE OneDrive folder, only accessible to the researcher and the academic supervisor. Data should not be stored on a fixed or portable hard drive. Data include digital audio files, word files (e.g. interview transcripts), digitalised field notes.
Describe how the data will be collected (methods).	Microsoft Teams to record virtual interviews. These interviews will be recorded and audio recording transcription will be used and analysed accordingly. Once data has been analysed all transcription will be shredded and destroyed / permanently deleted from where it has been stored.
Describe how you will organise, structure and name your folders and files.	Assigning files alpha-numerical names and storing them in a OneDrive folder. The file names will be anonymised Person A, Person B and stored in a OneDrive folder.

Ethical and Legal Compliance	
Have you acquired consent to store, preserve and share data (stakeholders & participants)?	'Yes', the research has been granted ethical approval by UWE Bristol UREC (or external) and participants or data guardians have provided signed consent for this.
Who will have access to the data and why?	Myself and my academic supervisor
Will volunteers, public research partners or other support staff be involved in collecting, handling or analysing data?	No.
If others are involved in collecting, handling or analysing data, what will their involvement be?	N/A
If others are involved in collecting, handling or analysing data, what ethical and data protection measures will be put in place?	N/A
How long will the data be stored for and why?	Audio data normally stored until dissertation/project submission. Word or SPSS files can be retained indefinitely to allow further write up and dissemination
How will you protect the identities of participants? (e.g. anonymization, use of pseudonyms, etc.)	Non-identifiable alpha-numerical file names should be used for audio and Word files. Pseudonyms will be used to describe participants. All identifiable data must be destroyed immediately following anonymisation. Locations should also be removed / withheld from the data and from any future published outputs. This is even more important for this project involving a group of individuals from a organisation i.e. Mobilates.
How will you handle sensitive data, ensuring it is stored and transferred securely?	Digital audio data should be uploaded directly to a password protected, encrypted OneDrive folder (as described above) and deleted from the recording device immediately following upload. This process would apply to any potentially sensitive data being transferred from one secure location to another.
Who will own the data (copyright and Intellectual Property Rights)?	UWE student
Are there any restrictions on the reuse of third-party data?	Not normally

Will further permission or consent be needed to use or share third-party data?	N/A
Data Storage and Back-up	
Where will the data be stored and backed up during the research?	All data will be stored in a UWE OneDrive folder as stated above and not stored on a computer hard drive.
How frequently will the data be backed up and to which locations?	Continually backed up to one drive.
Who will be responsible for backup and recovery?	The student/researcher
How will the data be recovered in the event of an incident?	From OneDrive – student and/or supervisor
Where will hardcopy data be stored?	Normally, hard copy data not kept; field notes may be scanned and stored in OneDrive. Any essential hardcopy data should be stored in a secure location – see guidance on UWE website.
Who will have access to electronic and hardcopy data?	Student/researcher and academic supervisor
How will you control access to the data to keep it secure?	Access only to student/researcher and supervisor
If collecting data in the field, how will you safely transfer it to your main secure system?	Digital audio data will be uploaded to OneDrive via a password protected computer as soon as this is possible following completed interviews. The audio data will then be deleted from the audio device. Person identifying data will not be audio recorded to the recording device during interviews.
Data Sharing	
With whom will you share the data, and under what conditions?	Academic supervisor to discuss and review data during analysis.
How will you share data – e.g. OneDrive?	UWE OneDrive folder shared between student/researcher and academic supervisor.
Data Preservation	
Will the data be retained or destroyed after the study?	All audio data will be deleted from the recording device immediately after upload

	to OneDrive. OneDrive audio files will then be destroyed at the time of project submission when the research has been written up. Anonymised interview transcripts will be retained indefinitely from Microsoft Team's recordings for further write up, publication and dissemination.
If retained, why will it be retained (e.g. for further research purposes)?	For further data analysis and publication. These data will be completely anonymised.
If retained, have you sought permission and consent to archive and reuse the data?	Yes, as agreed in the participant information sheet and consent form.
If retained, how long will the data be stored for?	Indefinitely or to an agreed date.
If retained, where will preserved data be held? (you should discuss archiving with your supervisor)	e.g. On UWE OneDrive that the academic supervisor will have continued access to. Alternative archiving will be investigated.
If destroyed, how will the data be destroyed?	Audio files will be deleted from the audio recorder immediately after upload to OneDrive and then from OneDrive at the time of dissertation/research submission.

Appendix 7: Qualitative Participant Distribution Data Tally

Participant	Representation Level Tally
1	II
2	II
3	III
4	III
5	III
6	II
7	I
8	I
9	I
10	II
11	I
12	II
13	II

14	I
15	II

Appendix 8: Interview Participant Topic Guide

Opening Interview:

- Thank you for seeing me today and offering to take part in this study.
- I want to check you have read the participant information sheet and signed the consent form?
- You understand that the interview will be recorded and transcribed but your personal details will be anonymised.
- I have a list of topics that I want to address in relation to motivation for PA with your chronic musculoskeletal condition.
- Feel free to ask questions at any stage during the interview – and please try and relax!

Topics/Questions

REMEMBER TO RECORD AND TRANSCRIBE!

1.
 - a. What has lead you to take part in Mobilates?
 - b. What is your CMSK condition?
 - c. What does exercise do for you as an individual. What feelings / thoughts come to mind when you think about exercise?
2. If motivation was a 'onion with layers' what are your main motivations for exercise? What makes you participate? Can you describe the feelings associated with these main motivations?.
3. Do you have any personal aspirations that influence your motivation levels to participate in exercise? If so can you describe what these are?.
4. Have you come across any barriers to your motivation when exercising? Can you describe how this makes you feel in detail.
5. What would get in the way of motivation to exercise? Are there any activities that help increase your motivation? What feelings, or thoughts occur?.
6. What are your feelings about being guided through exercise? What does it do for you? Describe the reasons for the answer given.
7. What does 'exercising in a group' mean to you, and your motivation levels for exercise?

8. How easy does self-motivation come to you when it comes to exercise?
9. Lastly, if you could describe how you feel after exercise in one word, what would it be?

Closing Interview:

Anything that you want to ask me, or tell me about as you wanted to participate in this study.

Thank you for your time.

Part 2: Interviewer Reflection

1. What went well?
2. What could I improve on?
3. Any technical or other difficulties' that need addressing for future interviews?
4. Do any interview questions need amending?