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## Exploring the barriers and facilitators to making healthy physical activity lifestyle choices among UK BAME adults during covid-19 pandemic: A study protocol

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**Exploring the barriers and facilitators to making healthy physical activity lifestyle choices among UK BAME adults during covid-19 pandemic: A study protocol**

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### **Abstract**

Past research has identified that individuals from BAME communities face health inequalities and report poorer outcomes from numerous health interventions. This study will explore some of the reasons with a focus on the perceptions towards physical activity in the lifestyle prevention of diseases. It will also seek to elicit a range of facilitators and barriers towards improving physical activity lifestyle choices amongst UK BAME adults, including but not limited to those in the individual, structural, environmental and social domains. Furthermore, it will consider the role of ethnicity and culture in the forming of physical activity lifestyle choices. This study was conducted to explore the facilitators and inhibitors of making healthy physical activity lifestyle choices amongst UK BAME adults during the COVID-19 pandemic. The study will involve 2 phases: a systematic review and a qualitative study phase. The systematic review will be conducted using the PECO (Population, Exposure, Comparison, and Outcome) framework and the preferred reporting items for systematic reviews and meta-analyses (PRISMA) strategy. The qualitative study will be a semi-structured online personal interview of a purposive sample of 12 UK BAME adults residing in Teesside, Northeast of England (UK). The findings obtained would be useful in designing culturally relevant interventions that seek to improve physical activity lifestyle choices for UK BAME adults and inform future policy guidelines in the UK.

**Keywords:** Physical activity, ethnic minorities, lifestyle choice.

## Introduction

There is consensus among public health (PH) researchers that physical activity (PA) is a lifestyle choice linked to numerous physical and mental health benefits (Fibbins et al., 2020; Hasson et al., 2017; Jiao et al., 2021; Mbabazi et al., 2022). Adopting recommended levels of PA demonstrably reduces health risks such as obesity (Min et al., 2021) and chronic diseases: diabetes (Moore et al., 2019), cardiovascular disease (Gill et al., 2014), depression (Carmona-Torres et al., 2021), and osteoporosis (Koshoedo et al., 2015). In the United Kingdom (UK), the chief medical officer's report recommends a weekly average of 150 minutes of moderate intensity PA or 75 minutes of vigorous intensity PA for adults (GOV.UK, 2019).

Public awareness of the health benefits of PA is relatively high, yet researchers often meet with varying levels of success when designing interventions that target increasing the uptake of PA (Garner-Purkis et al., 2020; Kandula et al., 2015; Sevidl et al., 2020). It is widely acknowledged that adults from the Black, Asian and Minority Ethnic (BAME) populations in the UK report poorer access to healthcare advice (Memon et al., 2016.), lower health literacy (Amorim Adegboye et al., 2020) and lower engagement in PA (Koshoedo et al., 2015) when compared to the non-BAME population. This has put pressure on PH researchers to develop interventions to promote PA that target these populations (Calkins et al., 2021; Iliodromiti et al., 2016).

Against this background, researchers argued for the elevated importance of personal choice and attitudes towards health behaviours over structural barriers such as socioeconomic or contextual factors which also influence these behaviours in the BAME population (Ochieng, 2013; Mbabazi et al., 2022). All this has become even more relevant during the COVID-19 pandemic as PA is considered vital to metabolic health and lifestyle medicine, both central in improving underlying resilience and in decreasing vulnerability to infectious diseases (Meyer et al., 2020; Wood & Jóhannsson, 2020). Although there are many other lifestyle choices that impact on health, such as smoking, diet, sleep and stress management, PA is considered most modifiable amongst populations (Noble et al., 2015). There is consensus that lifestyle medicine, including regular PA, profoundly affects the prevention and treatment of numerous diseases, with some researchers going as far as equalling exercise to medication (Rippe, 2018). This has seen the UK government shift its policy on PA significantly, upgrading it from a cause of obesity and other health challenges to a physical inactivity "pandemic" in its own right, which is responsible for up to 53% of deaths worldwide (Piggin & Hart, 2017).

Several UK government agencies including the UK Health Security Agency and Office for Health Improvement and Disparities now promote PA to improve health outcomes, foster community cohesion, promote more environmentally friendly cities and have more productive and profitable companies (Piggin & Hart, 2017; GOV.UK, 2021). In the recent UK government policy document titled: *Advancing our health: Prevention in the 2020s*, PA has been identified as a key element in improving population health. The policy document further acknowledged the evidence of higher rates of physical inactivity amongst majority of the UK adults compared to those in other Western countries such as France, Australia, Netherlands and they have twice the level of inactivity seen in Finland (GOV.UK, 2019; Mbabazi et al., 2022). However, this policy and recommendation of the chief medical officer fails to recognise the challenges faced by the UK BAME population groups when making PA lifestyle choices, especially during outbreaks and other public health incidents.

The COVID-19 pandemic provides novel opportunities to critically examine how validated behaviour change models, such as the transtheoretical model of behaviour change (Jiménez-Zazo et al., 2020a) and the Capability Opportunity Motivation-Behaviour (COM-B) model (Coupe et al., 2021; Michie et al., 2011) perform in effecting or explaining behaviour change within this target population – BAME population. Therefore, this study will critically examine the general perceptions, barriers and facilitators to PA lifestyle choices within BAME adults in Teesside, North-East of England, UK, in the context of COVID-19 pandemic.

### **Literature Review**

Ethnic and cultural diversity characterise the contemporary UK experience, with a significant population growth of over 70% in the twenty first century coming from BAME populations (Sulley et al., 2021). For these BAME populations, the burden of numerous non-communicable diseases (NCDs) remains relatively higher while the health outcomes from NCD-targeted public health interventions remains relatively lower among them, when compared to their Caucasian counterparts (Moore et al., 2019; Sulley et al., 2021). Furthermore, PA is a UK public health priority due to its numerous physical and psychological benefits for the prevention and management of NCDs; but for decades, research continues to report lower PA participation rates amongst BAME populations (Asamane et al., 2019; Cross-Bardell et al., 2015; Horne et al., 2013).

To improve health outcomes, researchers argue for PA interventions to be culturally salient and tailored to accommodate cultural habits and beliefs (Amorim Adegboye et al.,

2020). This literature review critically explores what is already known about how BAME populations perceive PA, in order to identify the existing knowledge gaps in the literature.

### ***Knowledge of the Benefits of PA amongst UK BAME Populations***

BAME individuals often demonstrate a high level of NCD awareness and acknowledge the role which regular PA plays in preventing and managing NCDs (Sulley et al., 2021). In particular, Sulley et al. (2021) found that the majority of BAME adults: have heard about several NCDs, know someone in their community with an NCD, and are aware of NCDs in their family history. However, other researchers report that the causes of these NCDs are not always evident to some BAME groups or linked to lifestyle choices like PA but are sometimes open to other interpretations such as fate, chance or stress (Er et al., 2017). Furthermore, there is a general mistrust in health information which is sometimes regarded as conflicting, alongside a low awareness of support organisations, even though health professionals are viewed as a favoured source for reliable health information (Er et al., 2017).

Nevertheless, health advice from health professionals is not always transferrable to the personal circumstances of BAME individuals as this is sometimes not culturally sensitive (Moore et al., 2019). Significantly, many BAME adults are aware of the therapeutic benefits of PA, yet still struggle to engage regularly in PA (Katito & Davies, 2021). Many researchers continue to find novel ways to improve PA levels, and some consider parenting to be a crucial pathway towards sustaining PA from childhood into adulthood (Fonseca et al., 2018). The preceding suggests that people from BAME communities are often suitably informed about the curative benefits of PA, but this knowledge does not easily translate into more engagement in PA. There is therefore urgent need to investigate factors that inhibit the translation of this knowledge into behavioural change.

### ***Personal Factors Influencing PA Lifestyle Choices amongst UK BAME Populations***

Public health research places growing importance on the role of personal choices and responsibility in modifying behaviours (Er et al., 2017). This suggests that an individual's choice plays a more important role in affecting behaviour than other environmental factors.

Some research found that people from BAME backgrounds value autonomy (Visram et al., 2014), are indifferent to Eurocentric recommendations (Er et al., 2017) and advocate for race- and gender-oriented interventions (Jernigan, 2020). Katito and Davies (2021) believe personal perceptions about PA strongly influence PA levels among BAME adults. Horne et al.

(2013) also explain that particularly for BAME adults already experiencing a medical condition, the associated symptoms, particularly pain and anxiety, act as barriers for taking part in PA.

In overcoming these barriers, social and professional support can facilitate engagement in PA (Horne et al., 2013). Family and peers are critical in helping, especially older BAME adults, to overcome personal barriers such as cost, time constraints, safety concerns, and language barriers (Cross-Bardell et al., 2015). Family engagement in PA is a critical pathway to improve PA outcomes amongst younger BAME adults too, allowing them to exercise regularly in later life (Min et al., 2021). This implies that BAME adults often must navigate their way through personal challenges which require assistance from family and friends, and healthcare professionals.

### ***Structural, Environmental and Social Factors Influencing PA Lifestyle Choices amongst UK BAME Populations***

Many individuals from the BAME background are of low socio-economic status and they often have limited time for PA because of financial pressures to work more than one job (Sulley et al., 2021). Additionally, some researchers report lower access to health advice and health interventions amongst BAME adults leading to varying health outcomes within these populations (Jernigan, 2020).

Jernigan (2020) emphasised the influential roles of psychosocial stressors and environmental factors on PA. Likewise, Katito and Davies (2021) argue that environmental factors (such as weather, neighbourhood safety, and social factors), length of residency in the UK, and economic factors (such as gym membership costs) can significantly decrease PA engagement amongst BAME adults. These findings are echoed by Alhassan et al. (2014) who find that weather, neighbourhood safety and time are often reported as limiting constraints to engaging in PA.

Conversely, Horne et al. (2013) highlighted the importance of institutional factors regarding PA, especially amongst migrants. In the study, cultural and religious factors can sometimes impede participation in PA. This suggests that there are higher level factors that influence PA participation amongst BAME adults, and these challenges could pose a problem for PH professionals developing PA BAME-targeted interventions.



### ***The Relevance of Ethnicity and Culture for PA Lifestyle Choices amongst UK BAME Populations***

Owing to the comparably lower engagement and poorer health outcomes of BAME adults, researchers argue for cultural tailoring of PA interventions; however, the provided reasons are different and sometimes lack a theoretical framework (Jernigan, 2020). Pertinently, there is growing evidence that the health risk of BAME adults varies differently with body mass index (BMI), waist circumference, body shape and required levels of PA than for Caucasian populations (Jepson et al., 2012; Penn et al., 2014; Sowole et al., 2018; Katito and Davies, 2020).

Furthermore, Jernigan (2020) argues that black mothers are role models in their communities and are central to transmitting transgenerational messages about attitudes to PA, body image and health. Other researchers argue that upon migration, acculturation often results in a shift in family roles and a decrease in PA for first generation migrants, with minorities adopting more sedentary lifestyles than in their home countries (Sowole et al., 2018).

Additionally, Katito and Davies (2020) explains that cultural influences on body image that favour curvier bodies and restrictive roles often result in a decline in PA among women; this is consistent with the findings of Alhassan et al. (2014) who argued that cultural factors should be considered when designing PA interventions for BAME adults and that non-traditional PA like dancing are often preferred to formal PA. Also, religious barriers (Horne et al., 2013; Barnett et al., 2015), gender segregation requirements (Horne et al., 2013), unavailability of preferred physical activities (Penn et al., 2014) and a lack of visible role models with similar ethnicity (Jepson et al., 2012) provide a cultural context which any attempts at supporting PA within BAME communities must address.

### ***Characteristics of Interventions and Relevant Behaviour Change Models for PA Lifestyle Choices***

Several interventions have been successfully mapped to sub-categories of the Capability Opportunity Motivation – Behaviour (COM-B) model, emphasising the role of the public health professional as educator, persuader, personal trainer, modeller and enabler (Moore et al., 2019). The COM-B model explains that people enact a given behaviour over other choices, when the capability, opportunity, and motivation to adopt this behaviour are favourable (Coupe et al., 2021).

On another note, Jernigan (2020) argues that many interventions address biological factors when promoting behavioural change and fail to integrate contextual, social and emotional factors. This suggests that interventions which fully address the needs of people from BAME populations are required to make them fit for purpose. This requirement for PA health interventions to address a variety of needs amongst BAME adults led Visram et al (2014) to appeal for delivery models which are holistic and consider both lifestyle risk factors and strategies to avoid relapse. Pertinently, Barnett and Praetorius (2015) recognised that making knowledge available does not always lead to behaviour change and that more is needed to prompt people into action. However, to bring about behavioural change, Katito and Davies (2021) argued that health education should involve considerations around motivation and perceptions regarding barriers to behaviour change to be effective in increasing PA.

It is also noteworthy that the complexity in designing interventions has led other researchers to employ the transtheoretical model for behaviour change which argues that people progress through six stages when effecting any change: precontemplation, contemplation, preparation, action, maintenance, and termination (Jiménez-Zazo et al., 2020a). This suggests that addressing any challenges required at each of these stages would allow for the design of PA interventions that adequately address behaviour change challenges.

Conversely, Katie and Davies (2021) argued that a Social-Ecological model is required to address the challenging and often reciprocal interactions between a host of factors that are biological, psychological, socio-cultural and environmental in nature. This suggests that PA interventions targeted at BAME populations should employ suitable models to suitably address how they would achieve behaviour change.

### **Rationale and Significance of the Study**

The disproportionate impact of the global COVID-19 pandemic on people from BAME backgrounds has highlighted the need to study BAME populations in a more in-depth manner. Despite only amounting to 13% of the UK population, 35% of intensive care patients for COVID-19 in England were from BAME populations at the height of the first wave of the Covid-19 pandemic (Pan et al., 2020). BAME populations experienced a higher risk of getting a COVID-19 infection (Pan et al., 2020), poorer clinical outcomes (Coleman et al., 2021) and higher mortality rates (Batty et al., 2021) compared to the White population. Additionally, mortality rates for Blacks were 5 times higher and twice as high for South Asians when compared to Caucasians (Batty et al., 2021). Researchers agree that the COVID-19 pandemic

has been both disruptive of several health-related behaviours and negatively impacted on PA (Spence et al., 2021). The rationale for this study emerges from the belief that the perceptions of UK BAME adults concerning PA has changed markedly due to the COVID-19 pandemic.

The CINAHL, Amed, Medline, Embase, PsycINFO, SCOPUS and the Cochrane Library of Systematic Review databases were searched for studies on the perceptions concerning PA lifestyle choices amongst BAME populations; it was found that no known systematic review (SR) has investigated the existing primary studies exploring the barriers and facilitators of PA among UK BAME adults during the COVID-19 pandemic. Hence, a comprehensive evaluation of these primary studies, through a SR, will help to collate and pinpoint credible and current evidence on the current challenges associated with PA among UK adults, particularly during the COVID-19 pandemic.

Prior to COVID-19 outbreak, several studies, including SRs, had been conducted on PA amongst the UK BAME populations (Horne et al., 2013; Ige-Elegbede et al., 2019). These studies investigated generational differences in PA for BAME populations (Bhatnagar et al., 2015), barriers to PA for older BAME adults (Horne and Tierney, 2012, Ige-Elegbede et al., 2019), and the effectiveness of lifestyle interventions for prevention of harmful weight gain among adolescents (Hayba et al., 2020). However, there remains limited evidence about the experiences related to making healthy PA lifestyle choices amongst adult BAME populations in the UK.

The studies by Horne and Tierney (2012) and Ige-Elegbede et al. (2019) highlight a deficit in exploring the experiences of adults of African heritage, refer to American studies and now seem outdated, especially in view of advancements in technology and the COVID-19 pandemic, with almost all studies identified being older than 2010. The study by Hayba et al. (2020) is an Australian study on PA interventions on young participants aged 13 to 18, which emphasises the near absence of studies on ethnic minorities and analyses studies dating before 2014. This present study will differentiate itself from existing research by: examining only relevant primary articles conducted during the COVID-19 pandemic – for the SR phase of this study; and investigating the experiences related to making healthy PA lifestyle choices amongst a Teesside-based (UK) adult (18+) BAME population in the context of the COVID-19 pandemic in order to elicit the barriers and facilitators concerning PA participation amongst this population group.

Additionally, the existing literature highlight a paucity of research on how to design interventions for promoting PA that are culturally appropriate for BAME populations during pandemics. This need has become even more pressing in the current COVID- 19 climate. Critically evaluating any shifts in the perceptions of BAME individuals around PA due to COVID-19 would provide valuable insights on how to develop culturally responsive PA interventions and help improve health outcomes amongst UK BAME adults.

### Study Objectives

The objectives of this study are:

1. To explore the influence of the COVID-19 pandemic on the lifestyle choices related to PA among UK BAME adults.
2. To examine the perceptions of UK BAME adults towards PA lifestyle choices.
3. To determine the enablers, barriers and challenges to improving PA lifestyle choices within an UK BAME adult population.

### Theoretical framework

This study is based on two theoretical frameworks: the transtheoretical model of change (TTM) and the Capability, Opportunity, Motivation, and Behaviour (COM-B) model.

#### *Transtheoretical Model of Change (TTM)*

The TTM model is a behaviour change model that has been reported as useful in developing and evaluating interventions that seek to improve PA in adults ((Hashemzadeh et al., 2019; Jiménez-Zazo et al., 2020). Tables 1 to 3 below illustrate and summarise how the TTM model has been used extensively to provide extensive and effective use in changing behaviours like PA participation in adults and are adapted from Hashemzadeh et al. (2019).

**Table 1:** Trans-theoretical Model (TTM). Summaries of each participant construct

TTM Construct	Description
Stages of Change	
Precontemplation	Not active. Lack of intent to get involved in regular PA within the next six months
Contemplation	Not active but have the intention to engage in regular PA within the next six months

Preparation	Has started commitment to participate in regular PA.
Action	Has established participation in regular PA but have only done so for less than six months
Maintenance	Has maintained participation in regular PA for more than six months

**Table 2:** Process of Change participants

Cognitive Processes of change	
Consciousness raising	Enhancing knowledge regarding the benefits associated with PA
Awareness raising	Awareness of the health risks associated with lack of PA
Environmental re-evaluation	Analyse how physical inactivity (or sedentary lifestyle) benefits one's interpersonal relationships
Self-re-evaluation	Recognition of the benefits associated with being physically active
Social freedom	Show different approaches to be physically active

**Table 3:** Behavioural processes of change

Counter conditioning	Replace inactive habits with actions that are healthy.
Helping relationship	Seeking social support in the practice of sports in order to bring about a change
Strengthening management	Rewarding oneself for being active physically
Self-liberation	Creating a commitment to be physically active and planning of PA activities.
Stimulus control	Adopting the use of stimulus to maintain PA levels

Advantages and disadvantages of decisional making for PA	
Advantages	Felt benefits of regular PA participation.
Disadvantages	Felt barriers of participating in regular PA. e.g., PA could cause pain or fall

### COM-B Model

The COM-B model is another behaviour change model that has been used extensively and reliably to target and explain changes in human behaviour, and particularly in relation to PA (Bentley et al., 2019; Ellis et al., 2019; Howlett et al., 2019). It summarises how individual and internal conditions interphase with social and environmental conditions to provide the circumstances needed to achieve stated behavioural goals (Howlett et al., 2019). Used in combination with the TTM model, multiple distinct explanatory components will be used to explain potential influences on behaviour, and it is hoped this will help capture the motivations and reasons why PA interventions are taken up or not. Moreover, it has been argued that interventions theoretically underpinned by such behaviour change models help assure predictable and lasting change (Michie et al., 2011).

Tables 4 and 5 show examples of how the COM-B model has been used to predict and explain behaviour change as adapted from Michie et al. (2011) and table 6 shows how policy interventions can target different components of the COM-B behaviour change model as adapted from Kredo et al. (2018).

**Table 4:** Factors that influence individuals at risk for lack of physical activities

Key factors that influence individuals at risk for lack of physical activities: using COM-B model		
Capability	Opportunity	Motivation
Psychology (capacity to engage in necessary thought)	Physical (physical opportunity provided by the environment)	Reflective (Evaluation and plans)
Not aware of a healthy lifestyle. Lack the ability to budget	Unhappy about their body image	Lack of awareness of implications of not performing any physical

		activities e.g. cardiovascular disease, type 2 diabetes mellitus, cancers, mood disorders, stress, etc.
Lack of awareness of the implications of not doing physical activities e.g. cardiovascular disease, type 2 diabetes mellitus, cancers, mood disorders, stress, etc.	Limited access to gyms Lack of time	Beliefs about healthy physical activities verses unhealthy. Beliefs around financial costs compared to the level of reward
Physical (capacity to engage in any physical processes)	Social (cultures that dictate the way we do things)	Automatic Emotions and impulses arising from associative learning and can affect dispositions
Physical ability to carry out physical activities.	No positive role model performing the behaviour. Family not performing any physical activities Social norms amongst friends and colleagues	Mental Health (e.g. depression, low self esteem, anxiety). A sedentary lifestyle, such as. Addiction to television watching and frequent use of computer. Sedentary lifestyles increases the risks of mortality, heart diseases, diabetes, hypertension, colon cancer, hypertension, osteoporosis, hyperlipidaemic disorders, mental disorders. Current habits

(Source: Michie et al., 2011)

**Table 5:** Healthy Psychology and Health Promotion of Com-B Model

Identify intervention functions	Com-B Component		Identified barriers for not performing physical activities	Intervention functions
List of all the intervention functions available for the identified barriers to physical activities	Capability	Psychological	Not aware what physical activities promote a healthy lifestyle. Lack of awareness of the implications of not performing any physical activities e.g., heart disease, type 2 diabetes, some kinds of cancer, and obesity, low mood, stress, depression. Lack of ability to budget Lack of resilience to make changes.	Education Training Enablement
		Physical	Physical ability to go and exercise.	Training
	opportunity	Physical	Limited access to affordable gyms. Lack of time	Training Restriction Environment Modelling Enablement
		Social	No positive role model performing the behaviour. Families and friends also not performing any PA. Social norms amongst friends and colleagues	Restriction Environment Reconstruction Modelling Enablement
	Motivation	reflective	Lack of awareness of implications of not	Persuasion Incentivisation



			<p>performing any physical activities e.g. heart disease, type 2 diabetes, some kinds of cancer, and obesity, low mood, stress, depression etc.</p> <p>Beliefs about healthy physical activities versus unhealthy.</p> <p>Beliefs around financial costs compared to the level of reward.</p>	<p>Coercion</p> <p>Training</p> <p>Environment</p> <p>Reconstruction</p> <p>Modelling</p> <p>Enablement</p>
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(Source: Michie et al., 2011)

**Table 6:** Policy Matrix Tool

COM-B Domains	Behaviour Change Intervention functions								
	Education	Persuasion	Incentivisation	Coercion	Training	Restriction	Environmental	Modelling	Enablement
Physical capacity									
Psychological capacity									
Physical opportunity									
Social opportunity									
Automatic motivation									
Reflective motivation									

(Sources: Michie et al., 2011; Kredo et al., 2018)

## Methodology

This study will be carried out in 2 phases. The first phase involves conducting a SR which will critically examine literature pertaining to “study objective 1” while the second phase will be a qualitative study exploring the experiences and perceptions related to making healthy PA lifestyle choices amongst a Teesside-based adult BAME population - “study objectives 2 and 3”.

### Methodology for Phase 1 – SR

#### *Research Question*

What are the facilitators and barriers for making healthy PA lifestyle choices amongst adult populations in the UK?

#### *Methods*

The present systematic review protocol adhered to the PRISMA Guidelines for Preferred Reporting Items for Systematic Reviews and Meta-Analyses. The full protocol for this systematic review was reported and registered on PROSPERO (protocol number: CRD42022320070).

#### *Search Strategy*

Using the PECO (Population, Exposure, Comparison, Outcome) framework and the preferred reporting items for systematic reviews and meta-analysis (PRISMA) strategy (Moher et al, 2009; Bettany-Saltikov and McShery, 2016), an electronic research database search and manual search of professional journals on PA will be used to identify all the relevant primary research articles relevant to the topic (Tables 7 and 8). The electronic search will be focused on the CINAHL, Medline, SCOPUS, PsycINFO, PubMed, EMBASE, and Web of Science databases. The search terms, listed in Table 8, are medical subject headings (MeSH) keywords and their synonyms will be used for the search, with the aid of Boolean operators – “AND” and “OR” – and truncation “\*”.

**Table 7:** The PECO table

<b>Population</b>	<b>Exposure</b>	<b>Comparison</b>	<b>Outcomes</b>
Adult populations, UK	PA	Sedentary or inactive lifestyle.	Facilitators Enablers

			Inhibitors Barriers
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**Table 8:** List of search terms and databases to be used

Search (S)	MeSH Search Terms and Synonyms	PECO	CINAHL (Hits)	Medline (Hits)	SCOPUS (Hits)	PsycINFO (Hits)	EMBASE (Hits)	Web of Science (Hits)
S1	African	Population						
S2	Asian	Population						
S3	Black African	Population						
S4	Minority	Population						
S5	Ethnic minority	Population						
S6	Adults	Population						
S7	S1 OR S2 OR S3 OR S4 OR S5 OR S6							
S8	Exercise	Exposure						
S9	PA	Exposure						
S10	S8 OR S9							

S11	Obesity	Outcome						
S12	Overweight	Outcome						
S13	Physical exercise	Outcome						
S14	Physical fitness	Outcome						
S15	Mental health	Outcome						
S16	Mental well being	Outcome						
S17	Barrier	Outcome						
S18	Facilitator	Outcome						
S19	Experience	Outcome						
S20	Perception	Outcome						
S21	Belief	Outcome						
S22	Opinion	Outcome						
S23	S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20							

	OR S21							
	OR S22							

### *Selection Criteria*

The criteria for included studies are listed in Table 9.

**Table 9.** Selection criteria

Inclusion Criteria	Exclusion Criteria
Peer-reviewed qualitative studies (which for example use focus groups, semi-structured interviews or mixed methods (having a qualitative part))	Studies conducted only on non-adult or non-BAME populations
Studies written in English	Studies not written in English
Studies involving adult BAME populations in the UK and other European countries with similar health profiles	Studies involving non-adults
Papers published between 2016 to 2021	Papers published before 2016

### *Screening and Selection*

Three reviewers will be involved in the screening and selection of the literature eligible for inclusion. Two reviewers will be involved in the screening of the literature titles, abstracts, and full texts. In a situation where there is conflicting judgement concerning the inclusion of a literature in question, the third reviewer will give the final verdict (Bettany-Saltikov and McShery, 2016; Long et al., 2020).

### *Quality Assessment of Included Literature*

The Critical Appraisal Skills Programme (CASP) Checklist – will be used to assess the full content of the selected literature (Long et al., 2020). Using the CASP Checklist (a 10-question tool), the included articles will be graded for quality based on a percentage scale.

### *Data Extraction*

The JBI-QARI (Joanna Briggs Institute) data form will be used for the extraction of data in the included literature (Munn, Tufanaru and Aromataris, 2014).

### *Data Analysis*

A narrative synthesis approach will be adopted in synthesising results from the included studies.

## **Methodology for Phase 2 – Qualitative Study**

### *Research Paradigm*

The qualitative study phase of this research will use an interpretive paradigm to deeply explore the barriers and facilitators to healthy PA lifestyle choices among BAME adults living at Teesside, Northeast of England. Interpretivism conveys that reality in the world is socially constructed, it is intricate and subject to change (Crotty, 2013; Ryan, 2018). Furthermore, interpretivism presumes that the social world is essentially different from the natural world and that the meanings people hold towards phenomena in the social world are interceded via perception (Crotty, 2013; Ryan, 2018). In addition, Interpretivists assume that meaning comes out from the interface between individuals; hence justifies human conduct that is dependent upon description and language (Kivunja & Kuyini, 2017).

### *Research Design*

Hermeneutic phenomenology is the design chosen for this study (Neubauer, Witkop & Varpio, 2019).

### *Study Location*

This study will be carried out online amongst selected BAME adults in Teesside, Northeast of England (Middlesbrough Moving Forward, 2016).

### *Study population*

The study population will be BAME adults who are able to communicate in English.

### *Sample size*

Sample size of qualitative studies are typically small due to the nature of approach and the need to obtain rich and in-depth data (Ando et al., 2014). In this study, a minimum sample

size of 12 participants will be used to ensure adequate ability to obtain descriptive and emergent themes, leading to data saturation (Ando et al., 2014).

### *Sampling Technique*

This research study will use purposive sampling technique. This sampling technique is based on the judgement of the researchers as to who will provide the best information to meet the study objectives.

### *Access to Participants*

A BAME community head in Teesside has agreed to act as a gatekeeper for recruiting BAME adults through their community gatherings and will be the first point of contact. With his help, the researcher will identify eligible participants, give information leaflets and help obtain consent to contact from the participants.

### *Study Instrument*

Socio-demographic information and information pertaining to PA lifestyle choices in relation to the COVID-19 pandemic will be obtained from each of the participants using an interview schedule (Appendix 1).

### *Data Collection*

Data will be collected using online semi-structured interviews. Each interview will be 45 minutes long and will either be held strictly online due to COVID-19 safety protocol (Shrestha et al., 2020). Online interviews have been used successfully in health research and these will be conducted using the Zoom and Microsoft TEAMS software which both allow for recording (Lieux et al., 2021).

### *Data Analysis*

The interview transcripts will be obtained after recording on TEAMS. Transcripts will be thematically analysed manually, and subthemes and themes will be developed. The stages of the thematic analysis are illustrated below.

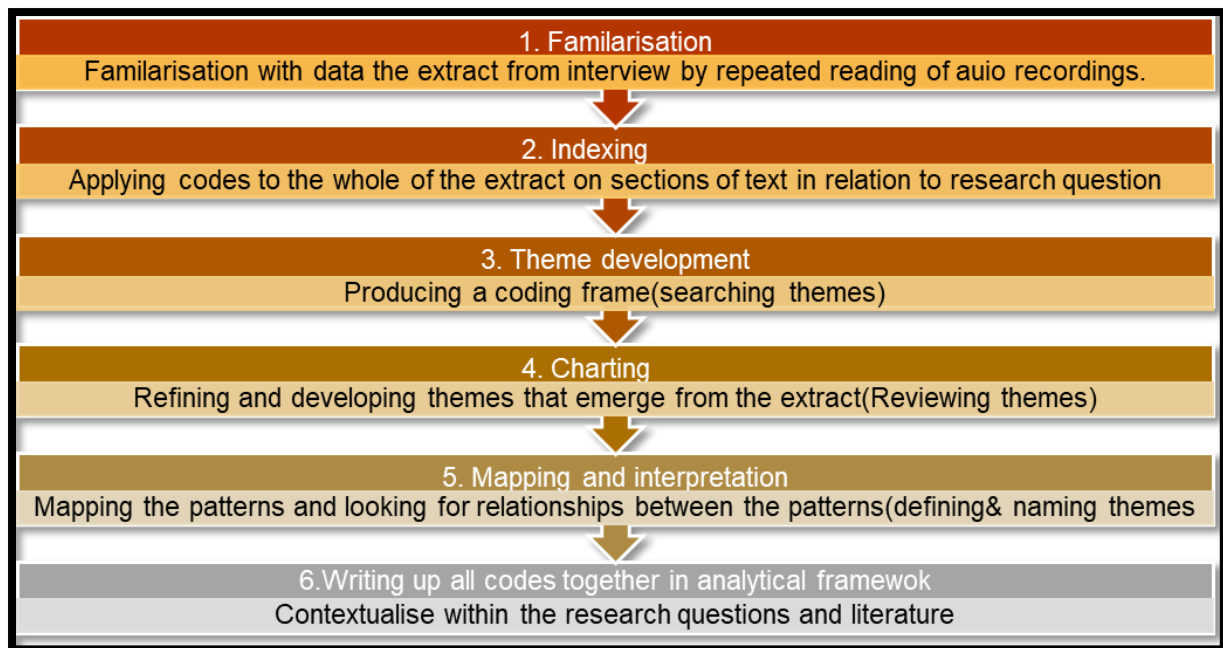


Figure 1: Steps involved in thematic analysis (TA) (Adapted from: Braun and Clarke, 2006)

### *Trustworthiness*

One main criticism of qualitative research is the difficulty of demonstrating scientific rigour thus making it questioned for its quality (Moon et al., 2016; Forero et al., 2018). To address this criticism, researchers have developed criteria for evaluating the trustworthiness of studies to check their transferability, dependability, confirmability and credibility (Moon et al., 2016; Forero et al., 2018). These will be achieved through a rich in-depth dependability description of the context and the sample will enhance transferability.

### *Research Rigour*

This highlight and maintains the quality of research, as it is significant to keep rigour and trustworthiness. One main criticism of qualitative research is the difficulty of demonstrating scientific rigour thus making it questioned for its quality (Moon et al., 2016; Forero et al., 2018). To address this criticism, researchers have developed criteria for evaluating the trustworthiness of studies to check their dependability, credibility and transferability (Forero et al., 2018). 29 Transferability in qualitative research is synonymous with generalisability. It is important in qualitative research as it is established by providing researchers with evidence that the research study's findings could be applicable to other, situations, times, populations and contexts (Moon et al., 2016; Forero et al., 2018).



Dependability is simply the consistency and reliability of the research findings and the degree to which research procedures are documented, allowing someone outside the research to follow, critique and audit the research process (Forero et al., 2018). The dependability of a qualitative study, can be checked and considered when the researcher has made mistakes in conceptualising the study, collecting the data, interpreting the findings and reporting results (Moon et al., 2016; Forero et al., 2018). This will be minimised as the researcher will keep a diary, audit trail, debriefs with supervisors and look for characteristics of participants that are necessary for the study and how they could impact the study.

Credibility is the confidence that can be placed in the truth of the research findings (Moon et al., 2016). Credibility establishes whether the research findings represent reasonable information drawn from the participants' original data and is a correct interpretation of the participants' original views (Forero et al., 2018). To ensure credibility, then it is imperative that a researcher accounts for personal biases which may have influenced findings. In addition to acknowledging biases in sampling and ongoing critical reflection of methods to ensure sufficient depth and relevance of data collection and analysis. No triangulation of methods. No triangulation of researcher.

Triangulation of theory however by using both TTM and COM-B models to explain behaviour change. The criteria will be discussed in the proposed study with evidence to what extent each selected study meets the criteria as well as its quality. In addition, the researcher is of BAME background, and reflexivity will constantly be performed to minimise research bias and personal values

### *Ethical Considerations*

Regardless of rigorous methodological protocols, ethical dilemmas can arise during any type of research and typically fall into one of three categories: privacy and confidentiality, informed consent, and the researcher-participant relationship (Ignacio & Taylor, 2013). To ensure that these concerns are addressed properly prior to the start of the project, ethical approval has been granted by Teesside University School of Health and Life Sciences Ethics and Research Governance Committee Reference: 2022 Mar 7747 MBABAZI.

Each participant will be fully informed about the study and written informed consent will be obtained on the consent form. Anonymity and confidentiality will be maintained, as identifiable information about participants will be substituted for unique identifying codes. Participants will be notified of the study's nature and consent prior to participation (McLennan

et al., 2018). Access to documentation and any digital recordings will be restricted to the researchers, with all data being archived for six years before being destroyed in accordance with Teesside University's data protection policies.

Additionally, any participant who decides to opt out of the research before data analysis begins may do so. This study will ensure that no psychological harm occurs during the interviewing process. The interview schedule will ensure that any questions asked, minimise potential harm. If any question elicits a negative memory, the researcher will pause the interview until the participant indicates that they are willing to continue.

### **Limitations of the study**

#### *Phase I – SR*

The limitation of this SR, which are generally common to all SRs, are indicated in Table 10.

**Table 10: Limitations to the SR**

<b>Items</b>	<b>Limitations to SRs</b>
#1	SR could also be biased on how papers are selected. For example, when not all primary articles available are not included in a particular research study. Arguably, in the inclusion and exclusion criteria of a SR, English language research articles are included but the non-English language articles are excluded. This could arguably affect the result of research findings as this is not a thorough representation of results (Gopalakrishnan and Ganeshkumar, 2013; Bettany-Saltikov and Mcsherry, 2016).
#2	Biases can occur as a result of reviewers not searching for research articles thoroughly as well as not drawing to relevant robust databases, searching for grey literature and hand searching, it is also likely that several important papers could have been omitted or ignored thus left out. There is a possibility that the SR may have not have accurately combined results of different studies suitably and thus providing imprecise results. It is fundamental for a SR to be appraised thoroughly prior before using the results findings. This means for the research to be robust several questions need to be asked in order to evaluate if a review in question was done systematically using all steps in the process precisely and concisely reducing bias greatly (Gopalakrishnan and Ganeshkumar, 2013; Bettany-Saltikov and Mcsherry, 2016).

The above limitations are largely due to biases. Nevertheless, SRs are considered the best evidence for getting a decisive answer to a research question, there are certain inherent flaws linked with it, for example the selection and location of studies, heterogeneity, loss of information on important outcomes, unsuitable subgroup analyses, duplication of publication and conflict with new experimental data (Gopalakrishnan and Ganeshkumar, 2013).

## Phase 2 – Qualitative Study

The limitations to the qualitative phase of this research are described in Table 11; these limitations are based on the plurality of the population being studied, potential observer bias, study sampling technique, financial limitation, and socio-demographic transition.

**Table 11: Limitations to the qualitative study**

Items	Limitations
#1	This study groups people from diverse minority ethnic backgrounds under one umbrella term called BAME to facilitate access to an adequate and reflective sample. This approach has been used successfully by other researchers (Asamane et al., 2019; Katito & Davies, 2021) but creates the challenge that the sample could be considered as a uniform group, which may not be the case.
#2	The student researcher is a male of Black African ethnicity and his background may introduce bias into the data analysis by highlighting or stressing the evidence from Black participants. Furthermore, the student researcher has done some previous research on obesity and body image and this study may permit the introduction of past convictions about PA. Nevertheless, subjectivity in the researcher is central to all qualitative research (Braun and Clarke, 2013; Baškarada & Koronios, 2018), and this may be considered a positive and helpful feature, instead of a limitation.
#3	The use of convenience sampling may skew the data by enabling access to a group of participants that is not a representative sample of BAME communities within Teesside. Other researchers recognise this challenge in qualitative research of accessing a sample that is both adequate and representative (Almeida et al., 2017).

#4	This study will be conducted within a limited budget and timeframe as indicated in tables 5.1 and 5.2 below and future studies with greater financial resources and less stringent time constraints may include a larger and more diverse sample.
#5	This study makes no distinction between generations of migrants, making the assumption that there is little difference in culture between generations. However, there may be significant cultural differences between different generations of migrants and also within different BAME subgroups considered in this study.

### Discussion

Physical inactivity is a primary cause of premature deaths in the UK and throughout the globe, and it is a modifiable risk factor responsible for the development of several sedentary lifestyle-related chronic diseases, such as cardiovascular diseases, diabetes, depression, anxiety, cancer, hypertension, and osteoporosis (Booth et al., 2017; Laake & Fleming, 2019).

The literature review in this paper has demonstrated a dearth of studies on how to construct culturally relevant treatments to promote PA among BAME groups. This requirement has grown even more critical considering the present COVID-19 pandemic environment (Spence et al., 2021). Evaluating any changes in BAME adults' perceptions of PA as a result of COVID-19 could provide useful insight into how to build culturally relevant PA interventions and hence assist improve health outcomes. The findings that will be obtained from the proposed SR will significantly benefit policymakers, social scientists, primary care clinicians, patients, commissioners, and other relevant stakeholders in the UK, given the recent National Health Service (NHS) long-term plan's emphasis on preventive medicine (Laake & Fleming, 2019).

Pertinently, the provision of PA encouragement and recommendations in communities enables public health experts to help people in achieving a healthy lifestyle change that will increase their PA, decrease their risk of early death, and improve their standard of living (Laake & Fleming, 2019). It is therefore anticipated that this research will determine the contemporary facilitators and inhibitors of making healthy PA lifestyle choices amongst UK BAME adults, particularly during COVID-19 pandemic.

## **Conclusion**

The complete manuscript will be submitted to a peer-reviewed journal for publication consideration. The findings of this SR will aid adult BAME individuals, whether educated or uneducated, in their understanding of the barriers and facilitators to PA, as well as patients, public health practitioners, public health consultants, governments, health promotion specialists, physicians, health-care providers, and policymakers. The study will contribute to the development of more effective government policy guidelines on PA and lifestyle improvements.

## **Dissemination strategy**

The findings obtained in this study will be presented at academic meetings. In addition, the study will be submitted for publication in a relevant health journal.

## **Funding**

Study will be self-funded.

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## Appendix 1

### Question Guide

#### Socio-demographic Data

1. How old are you?
2. What is your gender?
3. What is your sex orientation?
4. What council do you live in the Tees Valley?
5. Are you employed?
6. Are you a university student?
7. Are you still in education?
8. Do you have any health issues?
9. What is your marital status?

#### Questions on Physical Activities and COVID-19

1. Have you recently considered beginning any physical activities? If so, any reasons (pre-contemplation)?
2. Have you thought of doing any physical activities (contemplation)?
3. Can you briefly tell me how your physical activity participation has been in recent months. Any noticeable changes before, during and after lockdown including the type of physical activity you engaged in and how frequently you engaged in physical activity participation?
4. Has your motivation for performing physical activity changed?
  - i) Reasons for performing physical activities before COVID19?
  - ii) Reasons for performing Physical activities during COVID19?
  - iii) Reasons for performing physical activities (facilitators) overall?
  - iv) Pre and during COVID19)?

#### Exploring Experiences of Participants about Physical Activities who have Lost Motivation (COM-B Model)

1. Why have you ceased in engaging in physical activity?
2. What would have prevented you from giving up on physical activities?

3. Exploring general perceptions and feelings of Physical Activities
4. How do you feel about doing physical activities at the moment?
5. What are some of the reasons to explain your feelings at the moment?
6. Do you find it easy to conduct a physical activity?
7. Do you find it easy to speak about your family on the importance of doing a physical activity?
8. Are you generally happy about yourself as far as the physical activity you are involved in?
9. Do you feel any changes about you and your health when you perform a physical activity?
10. How do you feel about your physical activity habits?
11. Exploring experiences after the feedback process
12. Are there feelings or worry among the family members for performing physical activities?
13. Are there feelings or worry among the family members for not performing physical activities?
14. Are there changes in your way of life due to performing a physical activity?
15. Are there changes in your way of life due to not performing a physical activity?
16. Who are the providers of help that you have consulted?
17. Which help would you recommend to others and why?
18. What next planned about your physical activity lifestyle?

#### Exploring cultural experiences of physical Activities of Physical Activities

1. Does your culture play a part in your choice of physical activity?
2. How would you describe the role your culture plays in the performance of physical activities?
3. What aspect(s) keep(s) you motivated to pursue physical activities?
4. Would you describe your level of motivation as high to continue with physical activities? If so, why?
5. Have physical activities benefited your mental wellbeing? Can you please explain how and why?
6. Can you describe any factors that you think have facilitated or hindered your participation in physical activity (how and why)?

7. Are there any behavioural or attitudinal changes towards physical activity that you have seen in yourself since you began residing in the United Kingdom? Which and why?

Feelings about lifestyles

1. Do you think performing physical activities can act as an important lifestyle for you?
2. Do you think performing physical activities can act as an important lifestyle for family?
3. Do you think it is important to feedback changes due to physical activities to your family?
4. Generally, what do you make of the whole process?