A Primary Qualitative Study Exploring Adult BAME Individuals' Experiences Regarding Physical Activity from the North-East of England During the COVID-19 Pandemic

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Abstract

Researchers have found that people from BAME communities have worse health outcomes from many health interventions and face health disparities. BAME individuals experience health inequities and lower health intervention results. The experiences of adult Teesside-based BAME individuals' regarding physical activity (PA) during the COVID-19 pandemic were mapped onto the capability, opportunity, and motivation model of behaviour (COM-B). Twelve adult BAME participants were interviewed using semi-structured interviews that lasted 40 to 60 minutes and captured participant perceptions of how their PA and perceptions related to living a healthy PA lifestyle during the pandemic between April and August 2022 via Microsoft Teams. Using thematic analysis, 10 themes were generated, but only three themes were discussed. These include knowledge and awareness of the PA lifestyle, participants' perceptions of the opportunities to improve the PA lifestyle choice of adult BAME, and the change in perceptions of PA due to COVID-19 lockdown. While literature has explored the COM-B model, there have been generalised findings that are not specific to adult BAME individuals' lived PA experiences. The COVID-19 pandemic presents an opportunity to understand the shift in adult BAME perceptions and experiences during the coronavirus pandemic, therefore calling for the urgent need to modify both models in order to combat the high mortality rates of adult BAME individuals related to sedentary lifestyle diseases. This indicates that there is a critical requirement for the COMB model in order to implement policies. Nevertheless, limited PA studies have used lifestyle behaviour models to enhance behavioural modification.

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Introduction

The World Health Organization (WHO, 2023) defines physical activity (PA) as any skeletal muscle-generated movement of the body that causes an energy expenditure. Examples of such movements include general housework, gardening, walking, and other activities such as those associated with a gym.

According to Roth et al. (2020) on the Global Burden of Disease (GBD), those aged 25 and over living a sedentary lifestyle have risk factors responsible for approximately 1.3 million deaths globally (17 deaths per 100,000 inhabitants). The UK policy document 'Exploring health inequalities and disparities in respect of physical activity' (GOV.UK, 2022) estimated that physical inactivity costs the UK £7.4 billion per year and is associated with one out of every six deaths. When compared to the 1960s, the UK population is around 20% less active today. If this current trend continues, PA will have decreased by 35% by the year 2030.

Reversing this trend of low PA participation among BAME communities is a key component of the UK government's commitment to tackling the health inequities that exist within the UK. There is an established correlation between social deprivation and reduced PA (GOV.UK, 2022), particularly in individuals of African, Asian, and Middle Eastern descent within the UK. These individuals have been found to carry a significantly heavier burden of illness than people of other ethnic backgrounds (Pham et al., 2019; Chaturvedi, 2003). Attempts to address these issues through policies such as "Equally Well" (Zhai, Zhang and Zhang, 2015) and "At least five days a week" (Chen et al., 2021) were designed to address this disparity through increasing awareness of the advantages of PA and offering opportunities to participate (Tuso, 2015; Garner-Purkis et al., 2020).

In addition to general health inequalities within this population, discrepancies exist between the genders within the UK in respect of the amount of PA undertaken. More men indicate that they achieve the recommended levels of PA when compared to women (Craft, Carroll and Lustyk, 2014; Azevedo et al., 2007). Such gender discrepancies may be attributed in part to an individual's cultural origins and upbringing, through which perceptions of gender-appropriate activities are heavily influenced (Soltani et al, 2021). Mbabazi et al., (2023) identified that a variety of social and cultural norms in today's ethnic minority cultures

have made obesity interventions focusing on PA stigmatizing for some women, thereby failing to enhance their increased participation in PA.

Whilst previous studies (Ige-Elegbede et al., 2019; Farah et al., 2021) have explored the barriers faced by the BAME population participating in PA from a generic perspective, there is a paucity of research focusing on those barriers faced by older adults within this same population (Mbabazi et al., 2022a; Mbabazi et al., 2022b; Memon et al., 2016). Furthermore, research is lacking on those disadvantaged BAME adults living with chronic disease and co-morbidities related to a sedentary lifestyle, as well as those immune-compromised individuals who were more significantly impacted by the outbreak of COVID-19.

To aid in understanding the specific factors relating to disadvantaged BAME adults and PA, the COM-B behaviour change model and the Transtheoretical Model (TTM) will be applied within this research. COM-B has been expansively applied with reliability to target and explain people's behaviours, particularly in relation to PA (Bentley et al., 2019; Ellis et al., 2019; Howlett et al., 2019). This enables the identification of individual, social, and behavioural factors that may impact or facilitate individuals' engagement with PA (Howlett et al., 2019). When the COM-B model is combined with the TTM model that can be applied to explain potential influences on behaviours, this will enable this research to capture the motivations behind the lack of engagement when participating in PA. This two-pronged approach through COM-B and TTM will be more assured in enabling the development of interventions that will facilitate predictable and long-lasting change (Michie, van Stralen and West, 2011; Kredo et al., 2018).

Aim

This research aims to evaluate the experiences of a sample population of BAME adults from within an area of known high social deprivation and health inequalities within the North-East of England in respect of their engagement with PA during the COVID-19 pandemic.

Methods

Exploring the factors surrounding the engagement of BAME adults within an area of high social deprivation within the North-East of England was central to this study. This qualitative research was conducted at Teesside University, located in the heart of Middlesbrough and the Tees Valley, an area of high socio-economic deprivation (Trussell Trust, 2023). A hermeneutic phenomenological approach was adopted to enable a reflection of the participants lived experiences (Neubauer, Witkop and Varpio, 2019). When this was

combined with an inductive analysis of the collected data, it became possible to look at the problems people faced and how they dealt with PA based on their own experiences.

Purposive sampling was used to recruit twelve BAME participants enrolled at Teesside University. Whilst it is acknowledged that this sampling method may not be an accurate representation of the whole UK adult BAME population, it is a recommended technique when the population is large (Etikan, Musa and Alkassim, 2016). A gatekeeper was appointed to post a study invitation and recruitment information on the university's Virtual Learning Environment site, 'Blackboard', requesting expressions of interest. This enabled those participants meeting the criteria (Table 1) to be recruited from a diverse range of courses and settings.

Table 1: Inclusion/exclusion criteria

Inclusion Criteria	Exclusion Criterion
To be of BAME origin	Originating from a population not identifying as BAME
Residing within Teesside Region	
Adult (18 years or over)	
Conversant in English	

Whilst recruiting only those participants conversant in English may be considered prohibitive to engagement in this research, it is a requirement for all students enrolled at the university to meet a minimum level of spoken and written English. This negates the potential for misinterpretation of meaning during the translation of the data. Although the researchers do acknowledge that by recruiting only participants enrolled at the university, this will potentially have omitted many BAME adults of lower socio-economic status (Bonevski et al., 2014). Ethical approval was granted (withheld for peer review). Of the 14 respondents meeting the recruitment criteria, pilot testing was undertaken with the first two participants to enable any refinement of the semi-structured interview questions required and to build the confidence of the researcher in preparing them for any potential unforeseen challenges that may arise during the interviews (Malmqvist et al., 2019). The data from the pilot study with these two participants from this primary qualitative study was not included in the data obtained from those remaining. In addition, interview questions were specifically developed to align with the research objectives from the three domains of the COM-B model and the first two stages of the TTM (pre-contemplation and contemplation stages) models, which guided the development of the questions for the interview schedule. Some of the interview

questions regarding PA and culturally related questions were adapted from the article published by Katito and Davis (2021). The remaining twelve participants comprised of six males and six females, with an age range of ages 28–52. All were first generation adult BAME individuals residing in the Teesside area of the UK.

Semi-structured interview questions were selected as the most suitable method because they enable the researcher to apply a flexible, adaptive approach to the questions posed, facilitating a greater depth of questioning and evidence gathering (Ruslin et al., 2022).

All interviews were conducted using Microsoft Teams, as it is a medium that all participants and the researcher are familiar with since this was the primary virtual learning tool used by the university throughout the COVID-19 pandemic in line with many other institutions (Sah, Singh and Sah, 2020). Whilst participants were familiar with this virtual tool, it was a challenge and presented a potential limitation during the study. The study ensured that participants were able to engage with the interview in a quiet, undisrupted environment where privacy and confidentiality could also be maintained. This was addressed through the provision of a booked 'quiet' room on the university campus, with interviews conducted at a time convenient to all. Using Microsoft Teams enabled the research to observe the visual non-verbal cues (Byrne, 2022) in addition to acquiring audio recordings and live automated verbatim transcription (Lieux et al., 2021). During this process, field notes were taken by the researcher to allow cross-referencing with the transcription provided. This enabled the researcher to reflect on the participants' experiences, enhancing the trustworthiness and validity of the interview process (FitzPatrick, 2019). All participants were given the option to review their transcripts for accuracy and validity, with six taking up this offer with no amendments requested.

Maintenance of participant confidentiality was fundamental to this research, as a unique reference number was assigned to each participant, negating the use of any potential identifying features (Shaw and Holland, 2014). All collected data was securely stored on a password-protected server held by the university, with access only available to those directly involved in the research (Da Silva, 2021).

An inductive (data-driven) thematic approach for the data analysis, enabling effective engagement with and drawing of meaning from the data collected (Braun and Clarke, 2022). This process was manually undertaken with the acknowledgement of the researchers' own potential biases, whereby drawing true objectivity in 'meaning' from the data may be difficult. Recognising this, reflexivity by the lead researcher was integral to each of the six steps within this analysis process (Ward and Delamont, 2020). Through triangulation,

whereby two additional researchers independently analysed the data and devised themes, comparison and consensus were achieved (Varpio et al., 2017) through considered discussion.

In this study, the researcher has knowledge and experience about behaviour models and therefore knows what thematic codes are necessary when analysing data to answer the research question. Therefore, questions about capability, opportunity, and motivation in relation to behavioural change (physical activity) were used, and the interview questions were asked to each participant to understand their experiences or change in perception of the PA lifestyle during the COVID-19 pandemic. As illustrated in Figure 1 below, inductive reasoning is frequently referred to as a "bottom-up" approach to knowledge, in which the researcher uses observations to create a picture of the phenomenon.
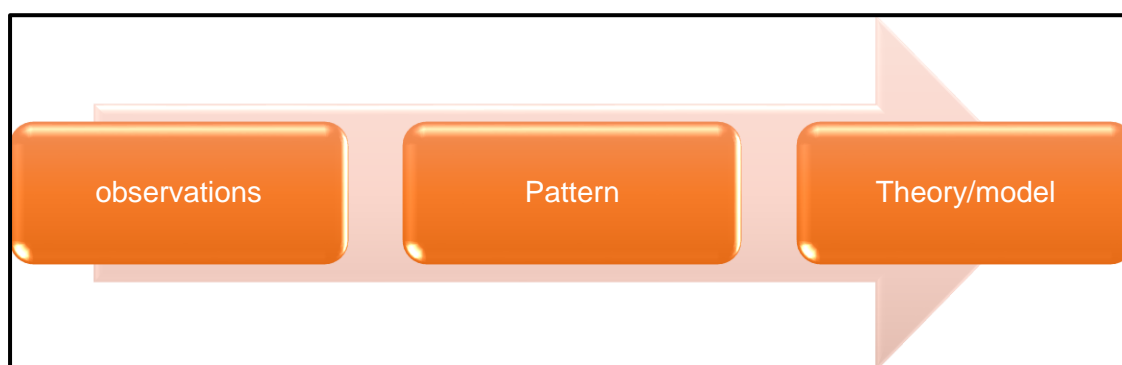

Figure 1: Adapted from Lodico, Spaulding and Voegtle, 2010

The inductive method is characterised by the search for patterns based on observation and the formulation of explanations for those patterns based on models or theories (COM-B and TTM) (Borgstede and Scholz, 2021). In an inductive approach, no models would apply at the outset of the research, and the researcher is free to change the trajectory of the study after the research process has begun. When formulating research questions and objectives for this study using the models (COM-B or TTM) (Farrugia *et al.,* 2010; Ratan, Anand and Ratan, 2019), it is essential to emphasise that an inductive approach does not imply ignoring COM-B or TTM patterns. This approach seeks to generate meaning from a data set to identify patterns and relationships for the purpose of developing a model; however, it does not prevent the researcher from using existing theory or models, for example, the COM-B or TTM, to formulate the research question to be investigated.

The researchers sought to draw on the COM-B model as the perfect behavioural change model for analysing experiences and perceptions of PA behaviour patterns that can be applied to an individual, group, or subgroup population (adult BAME individuals). This is

significant to understand if BAME adults have the capability, opportunity, and motivation to change their sedentary lifestyle behaviours. This is where the choice to map their experiences to the COM-B domain becomes significant. In addition, in order to understand the barriers or facilitators in relation to the PA lifestyle, it is imperative to understand whether the adult BAME population is thinking of giving up or living an active PA lifestyle. It is therefore significant to capture data on experiences and/or perceptions about pre-contemplation or contemplation of PA.

It is recognised that the dataset from twelve participants may not be considered reflective of the wider UK BAME adult population in respect of engagement with PA during the COVID-19 pandemic. In the primary qualitative study, interviews were conducted until data saturation (no new information was obtained from participants) was reached with 12 participants. In a study by Ando et al. (2014), data saturation was reached with 12 participants. The significance of "data saturation" is that a researcher can be pretty sure that collecting more data will lead to similar results and help confirm themes and conclusions that are already emerging. The interview phase was therefore closed as the collated data answered the primary aim of the research through the application of inductive thematic analysis, which was then mapped onto the COM-B dimensions.

Results

Twelve first-generation BAME adults living in the Teesside area were recruited from the student population of Teesside University. Their demographic breakdown can be seen in Table 1, with Table 2 demonstrating the ethnic breakdown by gender. To ensure the participants confidentiality, they were each assigned a unique reference number, from 1 to 12.

Table 1: Social- demographic characteristics of participants.

Demographics		No. of Participants
Age	28-35	6
	36-45	5
	46-55	1
Identified Gender	Male	6
	Female	6
Ethnicity	Black / Black British - African	9
	Asian / Asian British - Indian	3

Table 2: Ethnicity breakdown by gender

| Ethnicity	Identified gender	No. of Participants
Black / Black British - African	Male	5
	Female	4
Asian / Asian British - Indian	Male	1
	Female	2

Three overarching themes were identified through thematic analysis of the collated data: 'knowledge and awareness on PA lifestyle," 'participant perceptions on the opportunities to improve PA lifestyle choice," and 'The change in perceptions of PA due to COVID-19 lockdown'. The process of theme development is demonstrated in Table 3.

Table 3: Summary of process of thematic analysis and themes identified.

Supporting Quotes	Semantic Codes	Subthemes	Key Theme
"…there should be …some education programs…that can help people…"	Lack of general encouragement	Education programs on PA lifestyle provide knowledge.	Knowledge and awareness on PA lifestyle
"…PA of both moderate and intense intensity is beneficial to one's health."	PA activity during COVID-19 down to inner motivation	Benefits/importance of PA lifestyle.	
"...government should establish health promotional programmes that improve safety, offer information…"	Educational programmes that increase bicycle and pedestrian safety	Education programs on PA lifestyle provide knowledge	Participant perceptions on the opportunities to improve PA lifestyle choice
"…the local authority or government can build more parks or recreation centres. This means meeting up…"	Government establishing health promotional educational programmes that raise PA lifestyle awareness.	Local authority /involvement	
"Make more recreation parks more accessible to everyone from all walks of life"	Safe bike routes/safe walking path	Structural/organisational	
"I had no intention of doing any PA. I thought of starting after the pandemic. I feared going outdoors and contracting the virus"	No engagement with PA due to fear of infection.	Pre-contemplation	The change in perceptions of PA due to COVID-19 lockdown

"In truth, I have not been active in months since the lockdown, but I intend to engage after the lockdown".	Plan to engage with new forms of PA post-lockdown.	Contemplation	

To be able to explain and garner true insights from the themes identified, the COM-B behaviour change model was applied, as demonstrated in Figure 2.
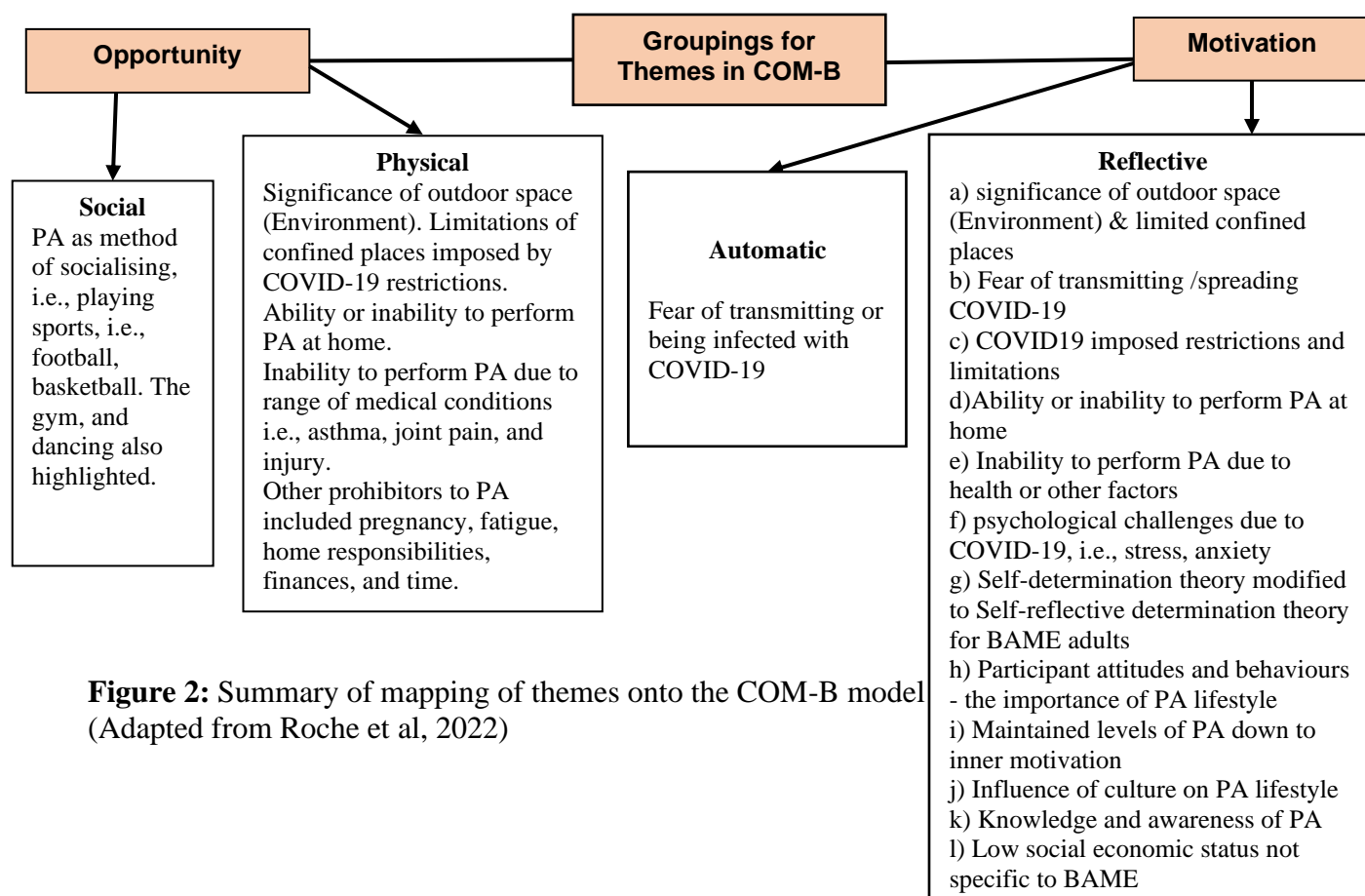
Figure 2: Summary of mapping of themes onto the COM-B model (Adapted from Roche et al, 2022)

Summary of the main findings

The three themes drew on the COM-B model, whereby participants behaviours could be explained, particularly in respect of motivation and reflexivity, and the transtheoretical model, which enabled the researchers to have a greater understanding of the influences on the participants behaviours.

All participants clearly demonstrated knowledge and awareness of PA and the many benefits that it may bring. Although, for most participants, the perceived barriers limited their effective engagement with it, including finances, childcare, and cultural/gender barriers, resulting in a predominantly sedentary lifestyle. Physical barriers such as a lack of amenities and recreation areas were also an issue for nine of the twelve participants, resulting in

increased physical inactivity. The social isolation resulting from the COVID-19 lockdown and social distancing measures led to a significant change in participants behaviours. This was particularly evident in those participants who previously engaged in team sports such as football and basketball and social exercise such as dancing. For many participants, whilst the will to re-engage with PA is evident, there is reticence due to ongoing fears regarding COVID-19 and lifestyle factors now making such engagement more challenging.

Theme 1: Knowledge and awareness on PA lifestyle.

The theme aligned with the research objective with three subthemes: knowledge and consequences of PA lifestyle, benefits of PA lifestyle, education programmes on PA lifestyle that provide knowledge, and local authority volvement. The main subtheme was the benefits of a PA lifestyle, which demonstrated an awareness of the role of a PA lifestyle and recognised the role that this can have in preventing or managing a range of noncommunicable diseases such as diabetes, cancer, heart disease, and stroke. PA was also seen as a means of enhancing their quality of life and overall mental health, with a range of activities identified as enabling this, including housework, mowing the lawn, and walking. For example, a participant stated:

> *"... PA of both moderate and intense intensity is beneficial to one's health."* (Participant 11)

Participant 9 echoed a similar view:

> *"......It is advantageous to one's health to engage in physical activity at both a moderate and intense level. PA refers to both strenuous and intermediate physical activity, which are both beneficial for a person's health"* (Participant 9).

Theme 2: Participants perceptions on the opportunities to improving PA lifestyle choice of adult BAME.

Three subthemes were generated from several opportunities highlighted by the participants, and these include: education programmes on PA lifestyles to provide knowledge; local authority involvement; and the need for the government (structural organisations) to support the members of the public. The primary subtheme coming through within this theme was the role of education and the need for this to stem from the government

and be fed down to the wider population through resources provided at local authority level. For example, participant 11 noted:

> "… *government should establish health promotional programmes that improve safety, offer information, and generally assist walking and cycling, ….*" (Participant 11)

Participant 7 stated:

> "*…to encourage more participation and engagement such that individuals live a PA lifestyle, the local authority or government can build more parks or recreation centres*" (Participant 7).

Building on this was the belief that there is a need at the national and local levels for increased safety and ease with which individuals can live a physically active lifestyle that can be accessible to all. Participant 9 said:

> "*…. I suggest that the government encourage more playgrounds, community centres, and outdoor spaces. "Make more recreation parks more accessible to everyone from all walks of life"* (Participant 9).

The perceptions of different genders became apparent within this, with one female participant stating that:

> "*.…constantly see some women having some setbacks in participating in physical activities. If the government could maybe engage us more, like bring in some tournaments and maybe for the female gender…*" (Participant 5).

Theme 3: The change in perceptions of PA due to COVID-19 lockdown

Two subthemes, pre-contemplating or contemplating, were generated from the participants data regarding their experiences when asked if they considered beginning the PA lifestyle. For many participants, their primary concern was the risks posed by COVID-19, which superseded any perceived benefits of PA. For example, Participant 9 suggested that:

> **"***I have not been doing any PA since COVID-19 pandemic. I had no intention of doing any PA. I thought of starting after the pandemic. I feared going outdoors and contracting the virus*" (Participant 9)

Participant 5 remarked:

> **"***I haven't tried swimming, and I haven't tried playing basketball in a crowd yet because I still have my resentment. So, I think COVID-19 found a way to make everybody think for themselves ...***"** (Participant 5).

Other participants appeared in a more contemplative mindset, recognising that PA is important and something that they would like to do a participant said:

> *"I want to improve my PA lifestyle"* (P2)

Participant 4 stated:

> "…*I am contemplating to do a lot of PA as time goes by, ... and I want to do them and maintain doing them"* (P4).

However, for most participants there appeared to be some reticence, although the reasons for this were not clear, as there was an acknowledgement of the fun that may come with PA. Participant 2 remarked:

> *"In truth, I have not been active in months since the lockdown"* (P2).

Another participant noted:

> *"Let us face it: some of them are fun to do"* (P4)

An understanding of this reticence and beliefs underpinning it will serve to enhance the implementation of future PA initiatives specifically aimed at addressing the needs of this population.

Discussion

This study aimed to explore the experiences of BAME adults residing in the Teesside area of North-East England, UK, with PA during the COVID-19 pandemic. It was clear that there is knowledge and awareness of the role of PA in maintaining physical and mental health, and quality of life may be enhanced through this. That said, although this knowledge was evident, many participants fell into a sedentary lifestyle during the COVID-19 pandemic and subsequent lockdown measures. Although inactivity grew during the pandemic, it is clear from this research that this was not a situation unique to COVID-19 but rather one that was prevalent with the UK BAME population prior to March 2020, as demonstrated by Ige-Elegbede et al. (2019). Therefore, this enhances the imperative to understand the underpinning barriers to better facilitate their engagement (Such et al., 2017).

Effectiveness of Health Promotion Programs

This research has demonstrated that there is no one single factor prohibiting or limiting participation, but rather that the issues are multi-faceted, requiring a diverse, multi-headed approach to their resolution (Mitchell, 2019; Koshoedo et al., 2015). Recognising the need for health inequalities within the UK to be addressed, different strategies were introduced, such as 'Equally Well' launched in Scotland in 2008 together with the Early Years Framework, and 'Achieving Our Potential" in 2009. This strategy recognised the significant health inequalities within the country and that diet and lifestyle choices were only two of many dynamics leading to these inequalities. The overarching aim of these was to enable people to review their perceptions of their external environment as 'manageable and worthwhile' (The Scottish Government, 2010). The aims of these were more overarching as an attempt to address health inequalities by promoting a range of health-related behaviours such as smoking cessation, eating a balanced diet, and weight loss, of which regular exercise was considered integral. Their premise underpinning this was the "sense of coherence" underpinned by each person's understanding of their world as a "comprehensive place" (The Scottish Government, 2010, p. 7). This sense of coherence is reflected in the key findings of this research, as demonstrated in Figure 3.
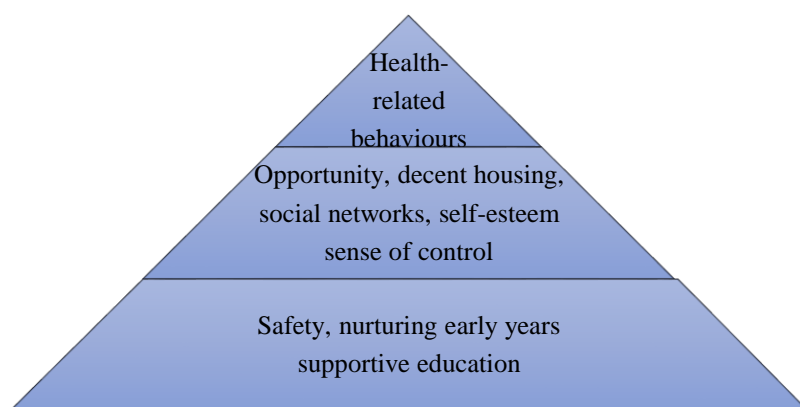

Figure 3: Sense of coherence – reflecting research findings (Adapted from The Scottish Government, 2010)

For any strategy promoting PA, there is a need to recognise this need for coherence, although, as evidenced within the UK and from the themes identified in this research, this remains a challenge where their priorities are by necessity financial, domestic, and cultural (Albert et al., 2020).

Role of Local Authorities in PA Promotion

This study's findings demonstrated that adult BAME communities need to be involved in education programmes on PA lifestyles to provide knowledge; local authority involvement; and the need for the government (structural organisations) to support the members of the public. Local authorities should prioritise encouraging PA instead of a sedentary lifestyle. This implies that local authorities need to provide the PA infrastructure, build more parks and recreation centres. Taking action to address PA is beneficial to a wide variety of long-term goals at the local level, such as social cohesion. Walking, cycling, active leisure, sports, and play are examples of some of the types of physically active goals that may be pursued within a community and can lead to wider benefits. This is because PA could affect people's lives and bring communities closer together.

Based on the primary qualitative findings, governments could develop health promotion educational programs that raise PA lifestyle awareness. These findings are similar to those in the literature, for example, in a study by Hahn and Truman, (2015). In the study by Hahn and Truman (2015), it is suggested that educational expertise and skills, such as knowledge, reasoning ability, emotional self-regulation, and interactional abilities, are critical components of health. The study also suggests health promotion and educational programs that are important for social determinants of health. Nevertheless, it can be argued that these health promotion programs could close gaps in educational outcomes between low-income or racial and ethnic populations and higher-income or majority populations, which are needed to promote health equity.

Moreover, from the primary qualitative study findings from the interview dataset, participants revealed the need for local authority involvement and to take charge of improving and involving BAME individuals in PA-related activities in their communities to combat sedentary-related diseases. From the primary qualitative findings, adult BAME individuals recommended that local authorities prioritise promoting PA by encouraging the local authority or government to build more parks or recreation centres. It was clear from this empirical study that the involvement of local authorities in the PA lifestyle can impact an active PA lifestyle or a PA sedentary lifestyle in the community. Holistically, from the primary findings of this study, it is recommended that the UK government fund more local authorities to support programs that engage the adult population living a PA lifestyle. There is a paucity of empirical studies conducted on adult BAME in relation to experiences related to making healthy PA lifestyle choices during the COVID-19 pandemic (Lebrasseur et al., 2021). For example, in the study conducted by Ige-Elegbede et al. (2019), it was

suggested that no existing studies explored the barriers and opportunities among adults and older adults from Black African communities in relation to living a PA lifestyle. This study is the first of its kind, filling the perception gap about knowledge and awareness of the PA lifestyle of adult BAME in the university of North-East England despite the increasing number of qualitative studies in other areas. Nevertheless, the current study's findings from BAME individuals are not limited to BAME individuals and can be applied to non-BAME individuals of low social and economic status. It can be argued that low-social-economic status groups are not limited to BAME but also include non-BAME groups.

Policy Analysis

The primary qualitative research findings were that adult BAME individuals recommended that local authorities introduce PA policies that encourage people to do more cycling. The government should introduce policies on working groups to encourage people to do PA. For example, cycling should be made safer so that passing cars in the street do not interfere with cyclists. A policy document titled "Cycling and Walking for Individual and Population Health Benefits," published by Public Health England in 2018, stated that PA on a regular basis has been shown to improve long-term health, including mental health, and prevent over 20 common diseases. In addition, the policy document agrees that there is limited evidence regarding the benefits of walking and cycling for individuals with disabilities. Similarly, little is known about the effects of deprivation on groups with varying levels of deprivation. It would be beneficial if these inequalities were addressed, particularly in terms of practical methods to increase these groups' access to physical activity. Therefore, more research is needed in PA, particularly in adult BAME populations. The Chief Medical Officers of the United Kingdom recommend that adults get 150 minutes of moderate PA per week (Public Health England, 2018). The easiest way to meet this recommendation is to take part in everyday activities like walking and cycling. In addition, the policy document highlighted that people, communities, and the health and social care systems all have to deal with the effects of physical inactivity on their health and finances.

This study's findings demonstrated that governments could improve a PA lifestyle by increasing safety and providing educational programs that facilitate walking and cycling. These findings are echoed by the findings of a study conducted by Gelius and colleagues in a systematic review in 2020. The study conducted by Gelius et al. (2020) recommended that PA policy development and monitoring be necessary to facilitate and safeguard walking and cycling to benefit from PA. Nevertheless, knowledge about which policies are effective in

promoting PA remains limited (Seppälä et al., 2017). Furthermore, Gelius et al. (2020) recommended that there is a need for the conflation of PA policies and PA interventions. It can be argued that it is essential to examine research approaches for collecting information on policies since there are currently no suitable resources for comparing specific policy programs. This also implies that government policies will need to enhance a PA lifestyle for both BAME and non-BAME individuals.

The Department of Health and Social Care (DHSC) established the Office for Health Improvement and Disparities (OHID) in October 2021. The OHID is working hard to address the causes of health inequalities (for example, deprivation, tobacco, alcohol, diet, and physical inactivity), which often disproportionately affect BAME cultural groups, as described in the health disparities white paper. The mission of the OHID is to improve and level up the health of the nation. Nonetheless, the OHID will never be able to achieve its objectives unless the factors that contribute to health disparities are identified. It can be suggested that this policy document highlights its limitations and the need for research to help adult individuals who are living a sedentary lifestyle. Culture, for example, has a significant impact on PA lifestyle among BAME in the UK, yet policymakers are also admitting that more could be done, which means more behavioural interventions are needed to safeguard adult BAME individuals who are already living a sedentary lifestyle and living with sedentary lifestyle diseases.

Application of COM-B, TTM and Comparison with Other Behaviour Change Models

There are many models developed to explain changes in behaviour, with the most common being the Transtheoretical Model (stages of change), the Health Belief Model, the Theory of Planned Behaviour, and the Capability Opportunity Motivation-Behaviour (COM-B) model (Michie et al., 2011; Liu et al., 2018), including health promotion models specific to communicating health messages that try to influence behaviour on a mass media scale. For example, communication persuasion (behaviour change) and social marketing theory and deciding the most effective one from the substantial number of models, have proved problematic (Hashemzadeh et al., 2019). However, the COM-B is a powerful diagnostic tool that allows researchers to identify the barriers to behaviour and design solutions that are more likely to influence the capability, opportunity, and motivation needed for individuals, groups, or populations. While TTM can be used to assess willingness to change behavioural lifestyles, for example, physical activity, because it appeals to the whole population rather than the minority ready to take action, both models are suitable to understand behaviours in

adult BAME individuals and thus suitable for the study. Several studies have indicated that behavioural science lifestyle behaviours such as PA can play a critical role in combating the effects of an infectious disease outbreak or public health emergency, such as the COVID-19 pandemic (Weston, Ip, and Amlôt, 2020). In addition, there is literature discussing the application of behaviour change theories within an infectious disease and emergency response context with a view to informing public health practice (Roche et al., 2022). There is a paucity of literature on PA lifestyle behavioural interventions in adults; nevertheless, there is currently an increasing number of reviews of literature drawing on behaviour change models (Ige-Elegbede et al., 2019).

Several intervention functions 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 individuals enact a given behaviour over other choices when the capability, opportunity, and motivation to adopt this behaviour are favourable (Coupe et al., 2021). On the other hand, Jernigan (2020) argues that many interventions address biological factors when promoting behavioural change but fail to integrate contextual, social, and emotional factors. This suggests that interventions are required that fully address the needs of people from BAME populations to make them fit for purpose. This requirement for PA health interventions to address a variety of needs led to an appeal for delivery models that are holistic and consider both lifestyle risk factors and strategies to avoid relapse (Visram et al., 2014). Likewise, Barnett and Praetorius (2015) recognise that making knowledge available does not always lead to behaviour change and that more is needed to prompt people into action.

Roche et al. (2022) conducted a primary study in London to investigate the barriers and facilitators to PA for different age groups during the COVID-19 pandemic. The purpose of this study was to map these onto a theoretical framework to assist in the understanding of PA behaviours and inform future interventions. According to the conclusions of the research, there is a restricted amount of space for the application of qualitative findings to theoretical frameworks. The COM-B is especially beneficial since barriers and enabling variables map directly into intervention functions. This helps influence the creation of interventions for future pandemics and health emergencies. Nevertheless, although the study by Roche et al. (2022) can support this empirical study, the findings are generalised and not specific to adult BAME individuals, which implies the COM-B and the self-determination theory, which can also be mapped on the COM-B model to capture adult BAME experiences during COVID-

19, meaning specific studies that capture experiences during COVID-19 for adult BAME individuals are needed. Furthermore, the study by Roche et al. (2022) suggests that the capability model (knowledge and skills), opportunity (social and environmental factors), and motivation (cognitive processes directing behaviour) are key for engagement in a target behaviour (Hagger and Hamilton, 2022; Roche et al., 2022). The COM-B model was successfully utilised in COVID-19. This, however, helped understand the psychological factors influencing compliance with social distancing guidance in generalised adult individuals that are not specific to adult BAME, thereby highlighting a research gap that needed to be investigated.

This complexity in designing interventions has led other researchers to employ the TTM 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). TTM is a useful and appropriate behaviour model that could be used in the method for developing, designing, and evaluating interventions that help adult BAME adults learn and improve PA behaviours. A study by Jiménez-Zazo et al., (2020) obtained similar findings, which agree with the novel findings of this primary qualitative study. It can be highlighted that although the study by Jiménez-Zazo et al., (2020) attained similar findings to this study, the findings of Jiménez-Zazo et al., (2020) were generalised and the study was not carried out specifically for BAME individuals and not during COVID-19.The study by Jiménez-Zazo et al., (2020) explored all four components of behaviour change, unlike this current study, which explored pre-contemplation and contemplation to capture BAME individuals' behaviours towards PA. Nevertheless, it can be established that further studies should consider the four components of behavioural change required to evaluate the impact that TTM has on the advancement of PA among BAME individuals. The primary qualitative study investigated the pre-contemplation and contemplation stages of change is that it is evident in the literature that the majority of adult BAME individuals live a sedentary lifestyle even prior to COVID-19. This study sought to understand their PA lifestyle and filled in the research gap with its findings.

Study strength and limitations

This study used qualitative research methods, which led to more in-depth data and explored issues facing adult BAME individuals regarding PA. This study is the first of its kind, therefore producing novel findings and adding to the body of research knowledge that can be used to improve PA interventions and PA policies. Nevertheless, this primary

qualitative study uses thematic reflexive analysis that is not tied to a particular framework and can be conducted in different ways that can be inductive or theory driven. More research is needed to understand from the current study's empirical findings whether all adult BAME individuals went through all the stages of reflection. This is one of the limitations of the primary qualitative study.

Moreover, the COM-B model in this study can be used to consider intervention components for increasing PA in future lockdowns and pandemics. Furthermore, some of the novel qualitative findings of PA in adult BAME individuals can help combat mental health, and PA as a way of socialising is a useful promotional message for the wider benefits of engaging in PA outside of pandemic times. Therefore, the findings of this study can be disseminated via local and national public health media campaigns that focus on the wider benefits of exercise for wellbeing and via local sport and PA networks. Additionally, this study gives context to the qualitative findings relating to PA during the COVID-19 pandemic. Furthermore, this study applied theory triangulation, which could reduce the potential for bias in the study by not relying on just one particular theory (Fusch, Fusch and Ness, 2018). Therefore, increasing the reliability of the findings requires using a variety of theories that establish trustworthiness by providing an in-depth overview of the research issue (Korstjens and Moser, 2018). The primary qualitative study led to a modification of both the COM-B model and the self-determination model, which is a novel application for future PA interventions that can lead to improved PA policies.

Implications for Policy and Practice

Local authorities should prioritise the promotion of PA by encouraging the local authorities or the government to build more parks or recreation centres. It is suggested that the involvement of local authorities in the PA lifestyle can impact active PA participation in the community. Holistically, it is recommended that the UK government fund more local authorities to support programmes that engage the adult population living a PA lifestyle. Therefore, public health policymakers and educators, as well as the departments responsible for health and education in the UK, could collaborate to implement educational programs and policies that deliver clear public health benefits.

Future interventions should focus on promoting factors and reducing barriers to PA through strategies such as increasing PA access to resources and providing knowledge, including the positive physical and mental effects of PA. Because of the challenges and effects of COVID-19, it is recommended that the COM-B model be modified as quickly as

possible to assist policymakers and public health interventions. There are several PA interventions that are based on the COM-B model and could be adapted for the adult BAME community. For example, in terms of motivation, an individual's lack of capability and opportunity could cause their 'need' to be physically active to be overshadowed by their 'want' for relaxation and cause them to remain inactive; inactivity is likely to be a behaviour for which they have high capability and opportunity.

However, if the individual's perceptions of capability and opportunity are altered as described above, their motivation to engage in PA behaviour could increase. Based on this notion, the key to PA behaviour modification would be to establish physical activity as something the individual not only 'needs' to do but also 'wants' to do. This can be attained by encouraging the individual to consider the long-term benefits of physical exercise (reflective motivation) and applying these benefits to make physical activity appear preferable to inactivity (automatic motivation). By portraying physical activity as a need and a desire, adult BAME individuals may be motivated to engage in the behaviour and overcome the competing behaviour of remaining inactive.

Conclusion

This primary qualitative study explored the experiences of adult, Teesside-based BAME individuals' regarding PA during the COVID-19 pandemic. Using thematic analysis, three main themes were found in the qualitative dataset. These include knowledge and awareness of the PA lifestyle, participants' perceptions of the opportunities to improve the PA lifestyle choice of adult BAME, and the change in perceptions of PA due to the COVID-19 lockdown. The findings demonstrated a shift and change in perceptions among adult BAME individuals towards living a PA lifestyle during COVID-19. On the motivation domain of the COM-B model, the automatic element findings were that participants feared getting infected with the Corona virus when they conducted outdoor PA. On the reflective element of the COM-B model, some BAME individuals were at a receptive stage and reflected on their PA lifestyle as well as contemplated living an active PA lifestyle. This study's findings demonstrated that the perceptions and experiences of adult BAME individuals were mapped onto the COM-B model domains. This indicates that there is a critical requirement for the COMB model to implement policies that will reduce the National Health Service (NHS). The COVID-19 pandemic presents an opportunity to understand the shift in adult BAME perceptions and experiences during the pandemic, therefore calling for an urgent need to modify both models to combat the high mortality rates of adult BAME individuals related to

sedentary lifestyle diseases. Nevertheless, limited studies have used lifestyle behaviour models to enhance behavioural modification. Therefore, there is a need to focus PA interventions on adult BAME populations using modified models, which will help improve policies.

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