University of Southampton

Faculty of Environmental and Life Sciences

School of Health Sciences

Strategies for engaging UK Ethnic Minority Communities to Improve their Diets and Increase their Physical Activity: Community Based Participatory Research During the COVID-19 Pandemic

by

Olatundun Yetunde Gafari BSc, MSc, ANutr

https://orcid.org/0000-0003-3416-5084

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Abstract

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Physical activity and healthy eating are important for good health, contributing to the prevention and management of physical and mental health conditions, and infectious diseases. UK ethnic minority communities often do not engage with efforts to improve these behaviours and continue to have lower physical activity and healthy eating levels compared to the rest of the UK population. Engaging with communities in designing interventions to improve their health can help improve the impact of those interventions. There is a dearth of evidence, however, on the best ways of engaging with ethnic minority communities to improve their health and consequently, how to adapt health improvement efforts to achieve greater impact. This thesis addresses this gap in evidence through a series of studies exploring strategies to engage UK ethnic minority communities in efforts to improve their diet and increase their physical activity. These studies took place during the COVID-19 pandemic, following increasing awareness of higher infection and death rates amongst ethnic minority communities which prompted increased public health actions to address these inequalities.

This PhD by publication involved four studies and is underpinned by community-based participatory research (CBPR) and qualitative research methodology. The first study was a scoping review that identified different categories of physical activity and healthy eating messaging targeting ethnic minority communities. Using qualitative interviews and focus group discussions, the second study explored how the available messages were received by ethnic minority communities. Study 3 also adopted qualitative research methods to identify the main values underlying physical activity and healthy eating behaviours among UK ethnic minority communities and to explore how structural, social, economic and environmental factors interact with these values. Study 4 described six main strategies that were key to building trust and increasing the inclusion of ethnic minority communities throughout the PhD and the project within which it was based.

Across the qualitative studies (Studies 2 and 3), a total of 41 people aged between 18-86 years old from ethnic minority communities living across the UK were involved (68% Black ethnic group, 53% women). Studies 1 and 2 found that despite a plethora of messaging, messages tailored to ethnic minority communities were limited and much of what was available was either entirely missed or where seen, not well-received. Study 3 identified culture, family, community, social and health as important values that shaped their physical activity and healthy eating behaviour, and that messaging, policies and programmes need to align with these values to ensure they were meaningful and relevant to these communities. A consistent finding across all studies was that community engagement and co-production were useful in ensuring that health promotion activities are relevant to diverse communities and the ways through which this could be achieved were described and presented in Study 4.

Collectively, the studies in this PhD demonstrate that actively engaging ethnic minority communities in the development, implementation and dissemination of messaging, policies and programmes to improve physical activity and healthy eating is essential to ensure those

interventions are well accepted by the communities. This PhD has also contributed to the evidence base on how efforts to improve physical activity and healthy eating can be made more relevant to ethnic minority communities, reducing health inequalities. Further research is needed to assess the effectiveness of these strategies in improving physical activity and healthy eating behaviours and ultimately, the health and wellbeing of UK ethnic minority communities.

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Research Thesis: Declaration of Authorship

Print name: Olatundun Yetunde Gafari

Title of thesis: **Strategies for engaging UK ethnic minority communities to improve their diets and increase their physical activity: community based participatory research during the COVID-19 pandemic.**

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. Parts of this work have been published as:-

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Every acknowledgement section risk omitting someone deserving of recognition and mine is no exception. So, this paragraph, is to you, that person or group that I have somehow forgotten to name, please know that I surely thought of you at some point during this journey, and I am grateful for your support.

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Abbreviations

BAME	Black, Asian and Minority Ethnic groups
BME	Black and Minority ethnic groups
CBPR	Community Based Participatory Research
CE	Community Engagement
Co-DICE	Coproducing diverse community engagement
Co-POWeR	Consortium on Practices of Wellbeing and Resilience in ethnic minority BAME families and communities
COVID-19	Coronavirus
EDI	Equality, Diversity and Inclusion
ESRC	Economic and Social Research Council
GDPR	General Data Protection Regulation
IPC	Infection prevention and control
NIHR	National Institute for Health and Care Research
ONS	Office for National Statistics
PAN	Physical activity and nutrition
PAN-Co-POWeR	Physical activity and nutrition work package of the Co-POWeR project
PhD	Doctor of Philosophy
PPIE	Patient and Public Involvement and Engagement
SAGE	Scientific Advisory Group for Emergencies
UK	United Kingdom
UKRI	United Kingdom Research Innovation
US	United States
WHO	World Health Organisation

Glossary of terms

Behaviour change intervention: Activities or actions designed to support people in adopting, maintaining or changing specific behaviours

Co-production: ..... The act of working with members of the public equitably to create knowledge, develop interventions or carry out research.

Health messaging: ..... Communication strategies developed for the public to inform, influence, educate or support them to make healthier choices. Health messaging is a form of public health interventions

Health promotion: ..... The process of enabling people with the information or resources they need to improve their health. This includes actions to support positive behaviour change as well as social and environmental changes to promote health.

Nuffield ladder of intervention: A framework developed by the Nuffield council on bioethics that ranks public health interventions based on how much they intrude on individual's autonomy. There are eight levels ranging from doing nothing to eliminating choice.

Public Health interventions: Actions to protect and improve population health and wellbeing wholly.

UK Ethnic minority: ..... Group of people in the UK that do not identify as being from the White British ethnic group. This includes people from Asian, Black, Mixed, multiple and other ethnic groups.

Values: ..... Deeply held beliefs and principles that guides people's behaviours and attitudes.

Chapter 1 Introduction

1.1 Structure of this thesis

This thesis adheres to the regulations for a member of staff in candidature for the degree of Doctor of Philosophy by papers 2024/25 at the University of Southampton and has the following format: the aims and nature of the research; coherence between the materials; how materials fit within the context of other work in the field; and the nature and extent of candidate's original contribution. These topics are presented as five chapters.

Chapter 1 describes the background, rationale and nature of the research, setting out the research aims and objectives. Chapter 2 discusses the context for the studies and the overarching methodology adopted. Chapter 3 provides a summary of the three papers included in this thesis, explaining the story they tell. Readers are referred to the appendix to read the full papers which provide more detail of the studies. Chapter 4 discusses the interrelationships between the findings of the studies and compares these findings with those of other related work in the field. Chapter 4 also discusses the implications for public health policy and practice and for future research. Overall conclusions of the thesis are presented in Chapter 5.

The three research papers forming this PhD are:

1) Misaligned or misheard? Physical activity and healthy eating messaging to ethnic minority communities during the COVID-19 pandemic: a qualitative study and scoping review (Gafari et al., 2024a).

2) Including the values of UK ethnic minority communities in policies to improve physical activity and healthy eating (Gafari et al., 2024c)

3) Building trust and increasing inclusion in public health research: co-produced strategies for engaging UK ethnic minority communities in research (Gafari et al., 2024b)

A detailed illustration of the structure of this thesis is presented in Figure 1.1, including what is covered in each chapter and how the content fits with the criteria for this thesis, as specified in the University regulations.

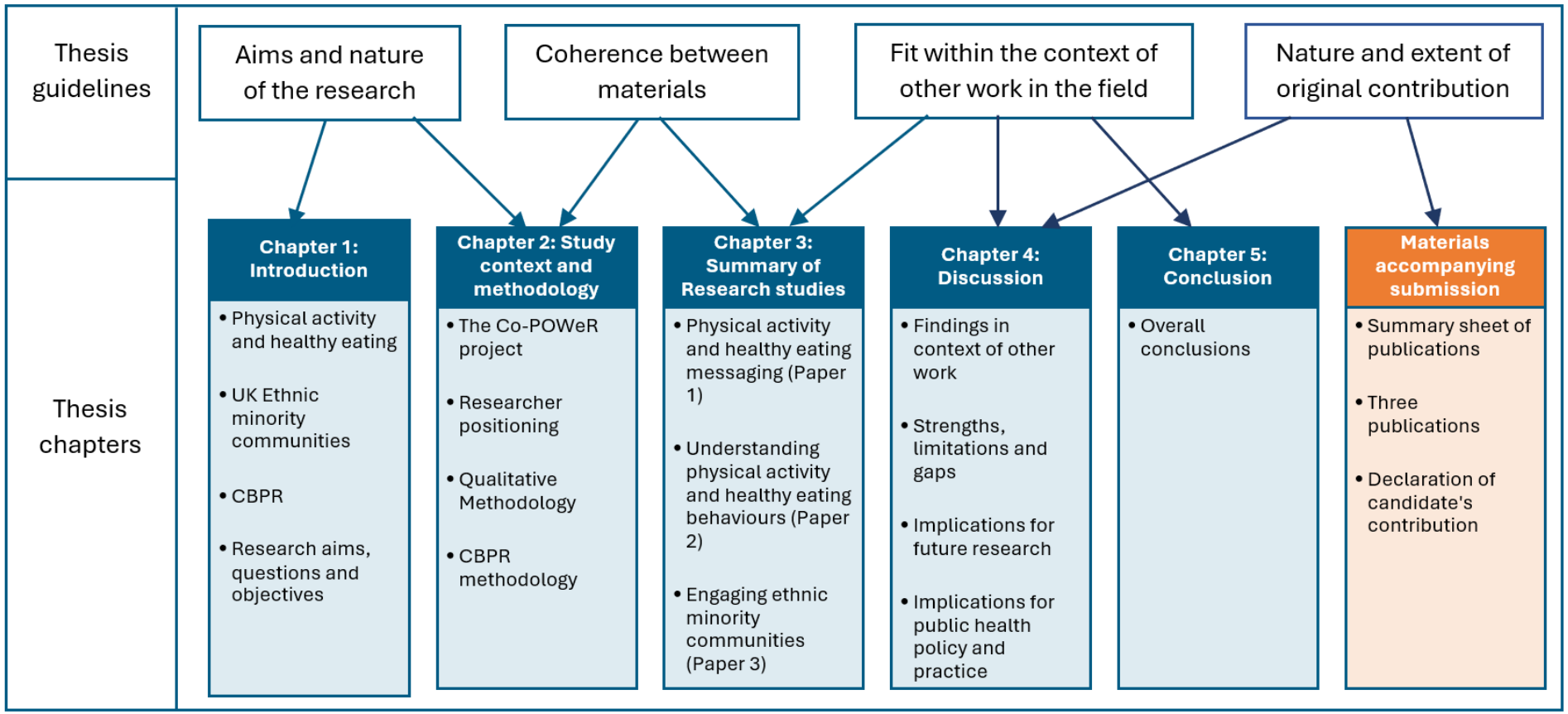

Figure 1.1 Illustration of thesis structure
Abbreviations: CBPR: Community-based participatory research; Co-POWeR: Consortium on Practices for Wellbeing and Resilience in Black, Asian and Minority Ethnic Communities and Families

1.2 Physical activity and healthy eating

Physical activity and healthy eating, i.e. eating a diet low in free sugars, fats and salts and high in legumes, fibre, fruit and vegetables (World Health Organization, 2020a), play a central role in overall health and wellbeing across the life course. Extensive evidence demonstrates the importance of these behaviours in the prevention and management of physical and mental health conditions and for healthy ageing (World Health Organization, 2022; World Health Organization, 2020a). Non-communicable diseases, including cardiovascular diseases, cancers and diabetes mellitus, which are the leading causes of mortality globally (Naghavi et al., 2024), are modifiable by physical activity and healthy eating (World Health Organisation, 2024; Naghavi et al., 2024). Through improved immune function, these behaviours also reduce the risk and severity of infectious diseases (Shao et al., 2021).

Physical activity and healthy eating also have economic benefits. Together, they contribute to reduced burden of diseases, hence lower healthcare costs and greater workplace productivity (Springmann et al., 2021; Ding et al., 2016; Hafner et al., 2020). A study that estimated the economic benefits of physical activity globally over 30 years from 2020 – 2050 found that if everyone engaged in at least 150 minutes of moderate intensity physical activity weekly, global gross domestic product could increase by an average of US$400billion annually (Hafner et al., 2020). Similarly, government investment in nutrition interventions is estimated to result in economic gains of US$10.5 trillion globally (Global Nutrition Report, 2021).

These all-round benefits of physical activity and healthy eating set these behaviours as the two most important behaviours of public health significance globally. Yet, efforts to improve these behaviours seem to be failing across different regions. Four in every five adolescents and over one in every four adults do not meet the World Health Organisation's (WHO) minimum recommendations for physical activity globally (World Health Organization, 2019; Strain et al., 2024), which is 150 minutes of moderate intensity activity per week (World Health Organization, 2020b). There has also been no improvement in global quality of diet over the last decade (Global Nutrition Report, 2021; Global Nutrition Report, 2022).

In the United Kingdom (UK), a similar situation exists. Approximately 37% of the adult population did not meet the minimum recommendation for physical activity in 2023 (Sport England, 2024). Looking at some important aspects of healthy eating, in 2022, only about 29% of the adult population met the 5-A-Day recommended consumption of fruit and vegetables (NatCen Social Research, 2024). Also, the average consumption of free sugars as a proportion of daily energy consumption across all age groups was recorded as 10% in 2021, two times higher than the 5% recommended maximum intake (Public Health England, 2021).

Similar to the global picture, there are variations in the levels of engagement in physical activity and healthy eating across different population groups in the UK (Sport England, 2024; Johnstone and Lonnie, 2023), reflecting persisting social and economic inequalities (Marmot M, 2020). These inequalities in power, and access to amenities result in health inequalities which consequently impact on peoples' ability to engage in health promoting behaviours including physical activity and healthy eating. One of these groups who have historically been underserved by the health, care and social system in the UK, are ethnic minority groups.

1.3 UK ethnic minority communities

There were 19 ethnic sub-groups categorised into five "high-level" ethnic groups used by the UK Office for National Statistics (ONS) in the 2021 national census (Table 1.1). The ONS refers to ethnic minority groups as every ethnic group represented in the UK except the White British group. In 2021, these ethnic minority groups represented a quarter of the population of England and Wales, approximately 15 million people (Office for National Statistics (ONS), 2022).

Table 1.1 ONS classification of ethnic groups in the UK (Office for National Statistics (ONS), 2022)

No	High-level ethnic group	Ethnic Subgroups
1	Asian, Asian British or Asian Welsh	Bangladeshi
		Chinese
		Indian
		Pakistani
		Asian other
2	Black, Black British, Black Welsh, Caribbean or African	Black African
		Black Caribbean
		Black other
3	Mixed or Multiple ethnic groups	Mixed White/Asian
		Mixed White/Black African
		Mixed White/Black Caribbean
		Mixed other
4	White	White British
		White Irish
		Gypsy or Irish Traveller
		Roma
		White other
5	Other ethnic groups	Arab
		Any other

There are, however, specific ethnic communities within the ethnic minority groups that have historically faced more disadvantages than others. These communities have been minoritised

not just because they constitute a smaller part of the population, but because they have historically experienced social injustice and inequalities in power. The term, "racially minoritised" has been used to describe these groups and to reflect that although minorities in countries such as the UK, they are in fact majorities globally (Law Society, 2022). Racially minoritised groups which includes all ethnic groups except the White ethnic group in the ONS high level classification of ethnic groups, is the definition used in this thesis to refer to ethnic minority communities. This is in line with the wider project on which this work is based.

There have been shifts in the language formally used to refer to ethnic minority communities in recent years, particularly following the COVID-19 pandemic, George Floyd's death, the Black Lives Matter campaign, and a subsequent increase in political interest in the topic of Equality, Diversity and Inclusion (EDI). The term, BAME/BME which stands for Black, (Asian) and Minority Ethnic groups was once popularly used but has now been declared obsolete (UK Government, 2021b; UK Government, 2021a). A more recent term widely used is 'global majority' (Campbell-Stephens, 2020), to empower people from historically minoritised communities because they are part of the majority in the world population. The term aims to shift conversations from a standpoint of disadvantage to one of advantage and to place the power of definition back in the hands of those being defined (Campbell-Stephens, 2020). While this term has received widespread adoption, the term 'ethnic minority communities' is used in this thesis because it is consistent with that used by the ONS and it prevents obscuring the reality for these communities that are currently minorities in numbers but also racially minoritised in the UK. The term 'ethnic minority communities' also highlights the need for actions to promote equity and transform the experiences of these communities to ensure that, although a global majority and a UK minority, they, like all people, are equitably served by society.

Long-standing social, economic and health inequalities exist between the White ethnic and ethnic minority groups in the UK (Nazroo, 2003; Marmot, 2020), and these were further exacerbated by the COVID-19 pandemic (Marmot M, 2020; Independent Scientific Advisory Group for Emergencies, 2020). Ethnic minority communities face disadvantages in almost every sector of society and while some progress is being made to reduce these disadvantages, they seem highly resistant to ameliorative attempts (Marmot, 2020). When compared to people with a White ethnic background, people from some ethnic minority groups are more likely to: live in deprived neighbourhoods (Jivraj and Khan, 2015), and in low-income and overcrowded households (Byrne et al., 2020); experience homelessness (Bramley and Fitzpatrick, 2018); be un- and under-employed (McGregor-Smith, 2017; Office for National Statistics (ONS), 2024); have lower attainment rates in higher education (Richardson, 2018); be more subjected to policing (Shiner et al., 2018; Byrne et al., 2020); and, to have reduced access to health and social care (Kapadia et al., 2022).

As expected, there are also inequalities observed in health, varying across different conditions and different ethnic groups. People from some ethnic minority groups have higher prevalence and risk of many non-communicable diseases including diabetes mellitus, strokes and cardiovascular disease (Raleigh and Holmes, 2021). Ethnic minority groups also had a higher incidence of COVID-19 infections and deaths (Independent Scientific Advisory Group for Emergencies, 2020). There was a misconception during the COVID-19 pandemic that the inequalities in COVID-19 cases reflect genetic and cultural factors peculiar to different ethnic minority groups (Lally, 2020; Fenton et al., 2020). However, presumptions that a specific gene variant in ethnic minority groups or vitamin D deficiency common to those with darker coloured skin increased susceptibility to the COVID-19 virus have now been debunked (National Institute for Health and Care Excellence, 2020; Zhang et al., 2020).

Health is determined by a wide array of social, economic and environmental factors (Whitehead and Dahlgren, 1991), and likewise, health inequalities reflect the wider social, economic and environmental disadvantages faced by these groups. These disadvantages, such as living in deprived neighbourhoods with limited access to healthy food shops and reduced access to green spaces for exercise, reduce the ability of people to engage in health promoting behaviours including physical activity and healthy eating. For example, Black and Asian communities in the UK are less likely to be physically active (Sport England, 2024) and are less likely to eat five portions of fruit and vegetables daily than the UK average (Public Health England, 2021).

Ethnic minority communities are also underserved by health and care research and interventions (Etti et al., 2021; Dawson et al., 2018), resulting in inequalities in the usability and relevance of research outputs and the effectiveness and impact of interventions. There are several possible reasons for this underrepresentation. Firstly, historic social and economic injustices, may have bred a lack of trust in the system (National Academies of Sciences and Medicine, 2022). This lack of trust coupled with previous negative personal experiences may lead to a reluctance to participate in or engage with public health research and interventions (Behringer-Massera et al., 2019; Reynolds et al., 2021). Similarly, the way research and engagement activities are organised may also result in underrepresentation. Issues such as differences in cultures, literacy levels, and priorities between researchers and members of the public, and use of lengthy and complex documents only provided in English, may produce barriers to involvement of these communities in research (Ocloo and Matthews, 2016; Ocloo et al., 2021).

Underrepresentation in research results in interventions, policies and programmes that are not relevant to the diverse needs of these communities, reducing their willingness to trust and engage in these interventions. Reluctance by some ethnic minorities to engage with the COVID-19 vaccination programmes is a clear illustration of this lack of trust (Scientific Advisory Group for

Emergencies (Ethnicity Subgroup), 2020). It is important for diverse ethnic minority communities to be actively involved in research, including research on physical activity and healthy eating, to ensure relevance to their diverse needs. This has potential to bridge the persisting gaps in both physical activity and healthy eating practices, and health.

1.4 Types of community-based participatory engagement with ethnic minority communities

There has been increasing global ambition to involve and engage the public in health and medical research (National Institute of Health Research, 2021; Staniszewska et al., 2018; Pratt and de Vries, 2018; Ahmed and Palermo, 2010; Minkler and Wallerstein, 2011) to ensure research is relevant to public needs. This involvement surpasses mere research participation but includes research where communities are actively involved in steering the research process from start to finish (Gafari et al., 2024b). Several terms have been used to describe different levels of engagement of the public in medical research including co-production, community engagement (CE), co-creation, community collaboration, participatory action research, community-based participatory research (CBPR) and more commonly used in the UK, patient and public involvement and engagement (PPIE).

Different definitions for these terms exist, however, the differences between the terms are difficult to understand particularly when they are used interchangeably in the literature. Some consider that CBPR and participatory action research fall within the same category and focus on a partnership approach in research where the researcher and the community have the same and equal levels of power, and the principles of equity and social justice are applied (Duke, 2020; Minkler and Wallerstein, 2011; Israel et al., 2005). PPIE and CE also refer to approaches where research is carried out with and by the public and not to, on or for them (National Institute of Health Research, 2021; Hickey et al., 2022). As with CBPR, co-production has been defined as an approach where power, responsibility and the creation of knowledge are equally shared by researchers and the public (National Institute for Health and Care Research, 2021; Tembo et al., 2019). This definition of co-production has, however, been criticised by some authors as being made unrealistic because of institutional, scientific and cultural constraints (Green and Johns, 2019; Tembo et al., 2019). For example, within a research team, there are different, unequal levels of power held by a research assistant and a principal investigator. Also, having a member of the public make the final decision on the choice of a scientific method may not always be beneficial to a research project, e.g. if an invalid or unreliable method was selected. This could potentially be addressed by ensuring people within the team had freedom to make decisions on what they feel is their area of expertise (Hickey et al., 2022; Green and Johns, 2019) or by providing some

research training for members of the public. Co-production has also been promoted as a set of principles to help improve the way PPIE is conducted. Williams and co-authors in 2020 posed the question: "Is co-production just really good PPI?" in their book chapter and pointed out that while with PPIE and CE, there are still power imbalances between the researcher and the public, in co-production and CBPR everyone is an equal partner (Williams et al., 2020). They suggest, however, that in reality, there are overlaps between the two and elements of co-production may help to improve PPIE activities (Williams et al., 2020). The National Institute for Health and Care Research (NIHR) guidance on coproduction is in agreement with this (National Institute for Health and Care Research, 2021).

There have been instances where CBPR and co-production have been referred to as a form of community engaged research (Wallerstein and Duran, 2010; Kwon et al., 2018), and other instances where CBPR has been referred to as a methodology and approach which encompasses methods such as co-production, PPIE and CE (Wallerstein et al., 2017; Duke, 2020).

Clarifying the differences between these terms is beyond the scope of this thesis but following extensive reading of the literature on CBPR, PPIE, CE, and discussions with experts in these fields, some broad definitions are described in Table 1.2 which were adopted for use in the body of work presented in this thesis.

Table 1.2 Adopted definitions of terms relating to community participatory strategies

Term	Adopted meaning
Patient and Public Involvement and Engagement (PPIE) or Community engagement (CE)	***Methods*** of carrying out research with members of the public rather than on them (National Institute of Health Research, 2021; Hickey et al., 2022). The terms were used interchangeably in this research because during engagement with some communities we found that because our work was community focused, people preferred to not be referred to as 'patients'.
Co-production	***Act*** of working with members of the public, sharing power, responsibility, knowledge creation and decision making from start to finish (National Institute for Health and Care Research, 2021; Tembo et al., 2019; Smith et al., 2022)
Community-based participatory research (CBPR)	The overarching ***methodology*** that involves valuing and equitably involving members of the public, practitioners, organisational representative and researchers in all aspects of the research process by sharing expertise and decision-making (Minkler and Wallerstein, 2011; Wallerstein and Duran, 2010; Holkup et al., 2004; Wallerstein et al., 2017; Israel et al., 1998). PPIE, CE and co-production all come within this broad methodology aimed at conducting research where the community can drive the research to suit their needs and priorities. CBPR can be combined with, and applied to, mixed methods research to ensure even when qualitative and quantitative studies are being conducted, they are driven and shaped by the community (Guan et al., 2023).

Evidence has shown that these participatory strategies are important in bridging inequality gaps and enabling research, policies and programmes to be tailored to the needs of diverse communities (Israel et al., 2005; De Las Nueces et al., 2012; Morales-Garzón et al., 2023). A systematic review published in 2022, on the use of CBPR methods to enhance participation of ethnic minorities in clinical trials found that these methods significantly increased the representation of often underrepresented groups in research (Julian McFarlane et al., 2022). The COVID-19 pandemic also highlighted the importance of these community engagement and participatory strategies and the recommendation by the Scientific Advisory Group for Emergencies (SAGE) and other government agencies was that these strategies are adopted when developing, planning and implementing public health activities (Kamal et al., 2020; UK Minister for Equalities and Race Disparity Unit, 2021). These recommendations influenced the funding of many research projects aiming to work with ethnic minority communities including the UKRI/ESRC-funded "Consortium on Practices of Well-being and Resilience in Black Asian and Minority Ethnic Families and Communities (Co-POWeR)", the project within which this body of work was conducted.

1.5 Study justification, aims, research questions and objectives

Physical activity and healthy eating are pivotal to overall health, wellbeing and economic growth. It has been established that ethnic minority communities are underserved by existing policies and programmes to improve health and wellbeing. It is important to understand how research, policies and programmes can be developed to improve physical activity and healthy eating among ethnic minority communities. This goal can only be achieved by working equitably with these communities to understand the breadth and depth of the problem, what matters most to them and how physical activity and healthy eating interventions can be made relevant, appropriate and useful to them, hence CBPR strategy is particularly suited to working on this issue.

The overall aim of this PhD was to engage UK ethnic minority communities in developing strategies to improve their diet and increase their physical activity using CBPR. This was achieved by addressing five research questions (Table 1.3).

Table 1.3 Research questions posed in this PhD

Timeline	Research Question (RQ)
Past	1) What physical activity and healthy eating messaging was targeted to ethnic minority communities during the COVID-19 pandemic?
	2) How do ethnic minority communities receive physical activity and healthy eating messaging, using the example of messaging during the COVID-19 pandemic?

Present	3) What values drive the physical activity and healthy eating behaviours of ethnic minority communities?
Future	4) How can we co-develop strategies and programmes to improve physical activity and healthy eating with ethnic minority communities using these values?
	5) How can we best engage with ethnic minority communities in research to improve health outcomes and reduce inequalities

The **research objectives** of this PhD are presented in Table 1.4.

Table 1.4 PhD Research objectives

	PhD Research objectives
Objective 1	To identify the different categories of physical activity and healthy eating messages produced during the COVID-19 pandemic that were targeted specifically at ethnic minority communities
Objective 2	To explore how physical activity and healthy eating messages were received by ethnic minority communities during the COVID-19 pandemic
Objective 3	To identify the values underlying physical activity and healthy eating behaviours of ethnic minority communities
Objective 4	To explore how structural, social, economic and environmental factors interact with the values of ethnic minority communities and influence their physical activity and dietary behaviours
Objective 5	To describe strategies that build trust and increase inclusion of ethnic minority communities in health interventions

The structure of this thesis was described in Section 1.1 and illustrated in Figure 1.1.

Chapter 2 Study context and methodology

2.1 The Co-POWeR project

The Consortium on Practices of Wellbeing and Resilience in Black, Asian and Minority Ethnic Communities and Families (Co-POWeR) project was funded by UK Research and Innovation via the Economic and Social Research Council (UKRI-ESRC). The consortium comprised co-investigators and researchers spanning multiple disciplines in health, law, and social and statistical sciences, from nine universities across the UK. The project addressed the joint impact of the COVID-19 pandemic and racial discrimination on the wellbeing and resilience of ethnic minority communities. This consortium was formed in response to increasing recognition of the long-standing disadvantages faced by ethnic minority communities and the disproportionate impact of the COVID-19 pandemic on these communities, evidenced by greater COVID-19 infections, severity of infection and deaths, compared with the general population (Independent Scientific Advisory Group for Emergencies, 2020).

The project (logo presented in Figure 2.1) consisted of five interlinked work packages detailed in Table 2.1.

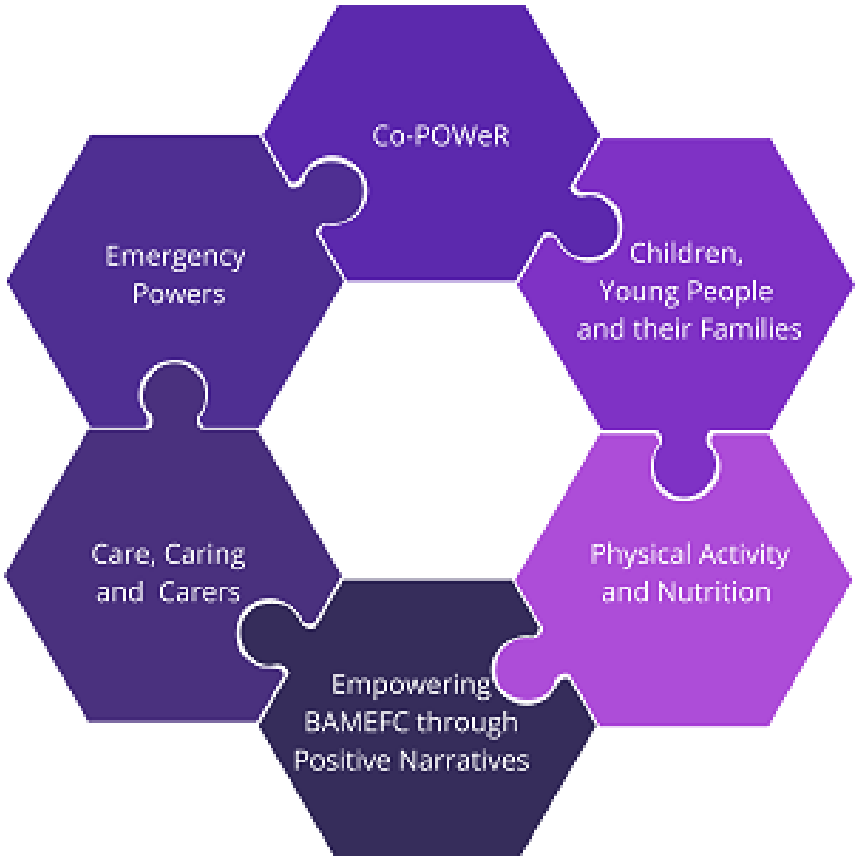

Figure 2.1 Co-POWeR project and work packages logo

Table 2.1 Co-POWeR project work packages and their aims

	Co-POWeR Work packages	Work package aims
1	**Emergency Powers**	Investigate the impact of policing and COVID-19 Act powers
2	**Children, young people and families**	Explore the impact of COVID-19 on the social, cultural and economic aspects of lives of parents/carers of young people, young people and professionals working with these groups
3	**Care, Caring and Carers**	Explore the experiences and care needs of older people, the organisation of unpaid care and impact of COVID-19 on care access
4	**Physical activity and nutrition**	Investigate the impact of COVID-19 and racial discrimination on physical activity and healthy eating and develop strategies to improve these behaviours. This PhD sits within this work package
5	**Empowering ethnic minority families and communities though positive narratives**	use theatre, graphic narratives, and short documentaries to empower communities

This thesis and the PhD it contain, describes the work carried out in Work Package 4 (Physical Activity and Nutrition), all of which was done by the author who was the lead researcher on this work package. This work package is henceforth referred to as PAN-Co-POWeR.

The PAN-Co-POWeR project in line with CBPR principles did not just involve insights into the experiences of eating and engaging in physical activity during the COVID-19 pandemic but aimed to work with communities to develop strategies and recommendations for improving these behaviours. Mixed methods, with community engagement at the core of the work, were adopted to meet the project aims.

2.2 Researcher positioning

2.2.1 Paradigm, ontological and epistemological positions

To improve the quality and methodological rigour of qualitative research, the researcher's philosophical position or paradigm needs to be clearly defined. This involves defining the researcher's ontological position (how reality is perceived) and epistemological position (how knowledge is perceived and the ways knowledge can be acquired).

An interpretivist paradigm was chosen as the appropriate paradigm to underpin this study. This paradigm suggests that reality is constructed based on peoples' subjective experiences and places emphasis on how individuals interpret the world they live in (Guba and Lincoln, 1994; Angen, 2000). People's experiences of physical activity and healthy eating differ and are subjective based on their past and present experiences. Developing strategies to improve these behaviours needs to interact with people's subjective priorities.

In line with this interpretivist paradigm, the ontological position that this study adopts is the relativist ontology. This position argues that there are multiple versions of reality dependent on the individual's social environment, cultural beliefs and norms, and experiences and interactions during the research process (Punch, 2013; Creswell, 2008). This is relevant to physical activity and healthy eating behaviours, the nature of which are also determined by a variety of factors relevant to a person's life and their environments. This stance allows the researcher to study these health behaviours in the context of the lived experiences and realities of those being studied. Similarly, this PhD also adopts a relativist epistemological position (Cresswell, 2013; Denzin and Lincoln, 2011); that knowledge is socially constructed and relative to different societies or cultures. Knowledge can therefore be constructed by interactions between the researcher and the research participant and there is no one universally valid perception of what is true or correct (Cresswell, 2013; Denzin and Lincoln, 2011). Engagement with the community was carried out throughout the PAN-Co-POWeR project to ensure the community, who have the lived experiences, also played a role in constructing the knowledge, i.e., findings and recommendations from the study.

2.2.2 Methodology

Qualitative research and CBPR were the overarching methodologies used in this study. Adopting these two methodologies ensured a robust way to address the research objectives.

2.2.2.1 Qualitative research

Qualitative research employs a methodology that aims to understand the meaning and context of aspects of peoples' lives and explore peoples' behaviours and experiences (Guba and Lincoln, 1994; Clarke and Braun, 2013; Denzin and Lincoln, 2011). It differs from quantitative research based on the kind of knowledge generated and the kinds of questions it seeks to address. While quantitative research tells us how one thing is related to another using objective means, qualitative research provides rich data on why things are the way they are and answers 'what', 'why' and 'how' questions (Denzin and Lincoln, 2011). Qualitative research also allows for the exploration of the unique experiences and way of life of often marginalised groups including, in

the case of the present study, ethnic minority communities (Clarke and Braun, 2013), hence relevant to the objectives of this study.

Within qualitative methodology, there are different methods used to collect data including observation, textual data collection and interactive data collection methods (Clarke and Braun, 2013). In line with the interpretivist paradigm underpinning this work and the objectives of constructing understanding of the experiences of ethnic minority communities with respect to their physical activity and healthy eating behaviours, interactive data collection methods were chosen as they allow for an in-depth exploration of people's experiences, opinions, beliefs and motivations permitting probing and follow-up of topics of interest (Brinkmann and Kvale, 2018).

The two main tools used to collect data through interaction with participants are interviews and focus groups. Although interviews are often thought of as being one-to-one, they can also sometimes be done in group settings (Morgan, 2002). However, focus groups have been defined as different from group interviews in the literature. Compared to other forms of group interviews, focus groups are designed to facilitate group interactions, prioritising the interactions between participants and the interviewer and these interactions form the data being collected (Brinkmann and Kvale, 2018; Morgan, 1996).

There have been differing scholarly views as to whether focus groups need to be narrowly defined to ensure their distinction from other forms of group interviews. One school of thought believes that group interviews are specifically one-way, where the interviewer aims to obtain data from one person or more, while focus groups are a two-way and reciprocal system where although the topic of conversation is guided by the moderator, conversations are open within the group and participants interact with one another, agreeing or disagreeing on different points (Edley and Litosseliti, 2010; Morgan, 1996; Brinkmann and Kvale, 2018). Some have used the terms interchangeably (Morgan, 2002), while others draw on the peculiarities of the different methods and use them to address their research goals and objectives.

In PAN-Co-POWeR and in the studies within this thesis, a combination of these arguments was adopted. The CBPR methodological principle guiding this PhD study was to prioritise approaches that allowed for open conversations co-driven by both the researcher and the research participants, hence focus groups was a more fitting method to achieve this. Focus groups were also chosen because physical activity and healthy eating behaviours are socially constructed and in line with the relativist epistemology underpinning this work, it is important to understand the cultural and social contexts through which participants experienced these behaviours. The objective of the studies included in this thesis, was to understand the experiences of the group, people of ethnic minority communities. Compared to interviews where the researcher asks questions and the participant responds, in focus groups, there is interaction between members

of the group and the researcher (Morgan, 2002; Clarke and Braun, 2013), and it is this construction and re-construction of ideas and experiences based on their social and cultural contexts that the studies in this PhD prioritises. There were however instances where individual interviews or smaller group interviews were required due to specific requests from the participants for example, if they wanted to discuss sensitive issues or for convenience. For example, some group interviews had as few as two people and so, did not meet the criteria for focus groups of needing to have a minimum of six people, as defined by some authors (Greenbaum, 1988).

2.2.2.2 Community-based participatory research

Community-based participatory research methodology (see Table 1.2 for definition of CBPR) was also used in conjunction with qualitative methods in this thesis. This method is particularly well suited for this PhD focused on ethnic minority communities because it emphasises power sharing, collaboration and respect, therefore facilitating an equitable relationship between researchers and members of the community (Israel et al., 2018a; Minkler and Wallerstein, 2011). Power sharing is especially important in research with ethnic minority communities who have a history of being disempowered and have lost trust in authorities because of long-standing inequities and injustice (Israel et al., 2018b; Behringer-Massera et al., 2019).

This method was adopted for two main reasons: 1) to facilitate the involvement and participation of ethnic minority groups, who are often marginalised (Julian McFarlane et al., 2022) and; 2) to ensure the way the study was constructed and conducted, and its findings and recommendations are relevant and suitable to ethnic minority communities, therefore reducing inequalities (Morales-Garzón et al., 2023; Kamal et al., 2020). This approach is relevant to the study's goal to increase physical activity and promote healthy eating among ethnic minority communities.

Rooted in action research, CBPR seeks to combine knowledge generation through enquiry and action using partnership to improve the health of communities and reduce health inequalities (Israel et al., 2018a). Questions of who benefits from research, for what purpose research is conducted (Israel et al., 2018a) and of what importance is knowledge generation when it cannot contribute to positive change in communities are all fundamental questions underpinning this research methodology. Compared to the traditional positivist methods of research, where the focus is to objectively study people and communities, Kurt Lewin in the 1940s developed "action research" as a form of research which seeks to use joint community efforts to solve problems (Lewin, 1939; Lewin, 1946). From the early works of Lewin, different methodologies have arisen including CBPR. However, all can be traced to this perspective on participation and action (Holkup et al., 2004).

Due to its community-dependent nature, the principles of CBPR are not comprehensive but Israel and colleagues in 2003 identified nine key principles (Table 2.2) which serve as a framework guiding CBPR. More recently, in 2018, after acknowledging that most CBPR takes place in marginalised communities and more frequently by researchers or institutional partners from privileged backgrounds, a tenth principle of CBPR was added: that CBPR addresses race, ethnicity, racism and social discrimination issues and that partners must aim to achieve self-reflection and cultural humility (Israel et al., 2018a).

These ten principles were used as the framework guiding the research activities in this study. In Table 2.2, examples of activities carried out during the PAN-Co-POWeR project underpinning this thesis and how they aligned with the ten CBPR principles are presented.

Table 2.2 Examples of PAN-Co-POWeR research activities and how they map to CBPR principles

	CBPR principles (Israel et al., 2003; Israel et al., 2018a)	PAN-Co-POWeR project activities
1	Recognises community as a unit of identity	Ethnic minority communities were the focus of the project. Activities involved working with members of the communities
2	Builds on strengths and resources within the community	Leaders of community groups were identified and engaged with as project partners to enable access to communities, enhancing recruitment and involvement of members of the public in the study
3	Facilitates collaborative, equitable partnership in all phases of the research	Community partners were engaged in all aspects of the research project from the start (funding acquisition and research prioritisation) to the end (dissemination) (Gafari et al., 2024b).
4	Promotes co-learning and capacity building among all partners	Learning for community members on presentation skills, and age-appropriate home exercises. Capacity building through co-chairing workshops and facilitating public events (Gafari et al., 2024b). For researchers, language and cultural sensitivity and awareness.
5	Integrates and achieves a balance between knowledge generation or research and action for the mutual benefit of all partners	Research dissemination event was changed to a transformative action workshop prioritising discussions with stakeholders on how co-produced recommendations might be actioned in the community (Gafari et al., 2024b)
6	CBPR emphasises local relevance of public health problems and ecologic perspectives that recognise and attend to the multiple determinants of health and disease	Joint agreement that physical activity and healthy eating were relevant and needed to be viewed through the lens of community and culture

7	CBPR involves systems development through a cyclical and iterative process	Decision making and planning meetings were held frequently with partners to jointly agree on project's next steps and identify areas for improvement.
8	CBPR disseminates findings and knowledge gained to all partners and involves all partners in the dissemination process	A transformative action workshop was co-designed with project partners and conducted at the end of the project (Gafari et al., 2024b). Project partners were co-authors on a paper published from the research (Gafari et al., 2024b).
9	CBPR involves a long-term process and commitment	Time was given to building relationships during the project. These relationships have outlived the project. The author volunteered at partners' community group and some partners were co-applicants in a subsequent research project.
10	CBPR addresses racial, ethnicity, and social class issues and adheres to cultural humility	Members of the community with lived experiences of ethnicity and social class issues were partners on the project and were involved in decision making meetings to ensure researchers could learn from their experiences.

2.2.3 Conclusion

Qualitative research methods underpinned by CBPR principles were used in the studies included in this thesis to engage ethnic minority communities in the development of strategies to increase their physical activity levels and improve their diets. Focus group discussions and individual interviews were used to gain in-depth understanding of these behaviours and the experiences of ethnic minority communities in the contexts of their everyday lives. The CBPR methodology adopted ensures that even when other methods are used such as scoping reviews (study 1) or qualitative methods (studies 2 and 3) to collect data, the overall research remains driven by and relevant to their community. The next chapter provides information on how these overarching methodologies were applied to the four studies included in this thesis.

Chapter 3 Summary of research studies

This chapter contains a summary of the four studies published as three research papers underpinning this PhD. The full papers are attached as appendices. Paper 1 (Gafari et al., 2024a) includes two studies while Paper 2 (Gafari et al., 2024c) and Paper 3 (Gafari et al., 2024b) include one study each.

3.1 Public health messaging for ethnic minority communities

In this section, public health messaging to improve physical activity and healthy eating among ethnic minority communities during the COVID-19 pandemic is explored.

Public health messaging, when appropriately designed and disseminated, plays an important role as part of the whole systems approach to improving healthy behaviours (Gordon, 2002; Vandenbroeck et al., 2007; McManus et al., 2008). The Nuffield Ladder of Interventions (Figure 3.1), developed by the Nuffield Council on Bioethics in 2007 (Nuffield Council on Bioethics., 2007), provides a conceptual framework that ranks public health actions according to their level of intrusion and respect for individual autonomy. Public health messaging fits within level two on this ladder (provide information). As a public health action, messaging upholds individual autonomy, while providing the public with facts that can help them make informed choices (Nuffield Council on Bioethics., 2007).

In reality, messaging on its own is rarely sufficient to result in sustained change in behaviour, however, it remains a vital public health action, complementing more intensive interventions that sit across the ladder (McManus et al., 2008; Gordon, 2002).

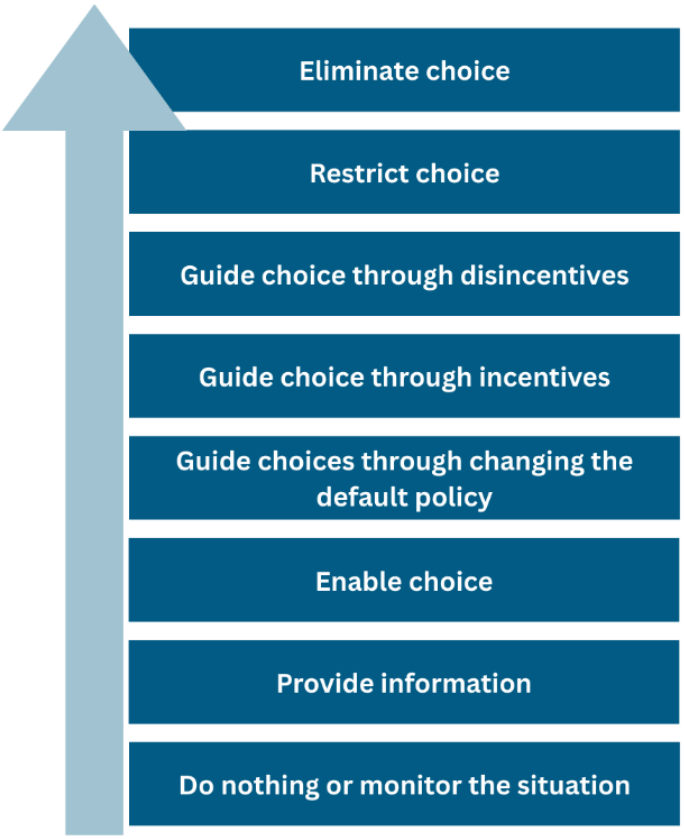

Figure 3.1 Adapted from the Nuffield Ladder of Intervention (Nuffield Council on Bioethics., 2007)

During the COVID-19 pandemic, the importance of public health messaging was reinforced (Wardman, 2022). The government and public health professionals rapidly adapted messaging to reflect evidence relating to the virus and to keeping safe. Messaging was mainly focused on Infection Prevention and Control (IPC) measures including use of masks, social distancing and receiving the COVID-19 vaccine. There was, however, lower uptake and compliance with these measures among ethnic minority communities (Public Health England, 2020; Scientific Advisory Group for Emergencies (Ethnicity Subgroup), 2020; Weiss and Paasche-Orlow, 2020). This could be due to several reasons including: language barriers; the underrepresentation of the voices of ethnic minorities (Scientific Pandemic Influenza Group on Behaviours (SPI-B) for the Scientific Advisory Group for Emergencies (SAGE), 2020); historical social and economic injustices faced by these communities (Scientific Advisory Group for Emergencies (Ethnicity Subgroup), 2020; Weiss and Paasche-Orlow, 2020); and messaging that clashed with cultural values and realities (Strömmer et al., 2022). For these same reasons, it is also possible that messaging promoting healthy behaviours, including physical activity and healthy eating, during the COVID-19 pandemic were similarly not received well by ethnic minority communities (Scientific Pandemic Influenza Group on Behaviours (SPI-B) for the Scientific Advisory Group for Emergencies (SAGE), 2020; Ala et al., 2021).

Many studies explored the impact of COVID-19 messaging but most of these focused on adherence to IPC measures (Weiss and Paasche-Orlow, 2020; Kamal et al., 2020; Williams et al., 2023; Block et al., 2020). Evidence on how ethnic minority communities received health messaging specifically physical activity and healthy eating is scarce, and government reviews have highlighted the need for qualitative evidence to understand the impact of such messaging among these communities (Scientific Pandemic Influenza Group on Behaviours (SPI-B) for the Scientific Advisory Group for Emergencies (SAGE), 2020).

The paper summarised in this section reports two studies (a scoping review and a qualitative study) conducted to explore physical activity and healthy eating messaging during the COVID-19 pandemic among ethnic minority communities.

3.1.1 Study 1: Scoping review of physical activity and healthy eating messaging during the COVID-19 pandemic.

3.1.1.1 Study rationale and objectives

Study 1 (Gafari et al., 2024a) (Appendix A) is a scoping review which followed the 5-step methodological framework by Arksey and O'Malley (Arksey and O'Malley, 2005), refined using the Joanna Briggs Institute (JBI) framework for scoping reviews (Peters et al., 2017). The study aimed to identify different categories of physical activity and healthy eating messaging available during the COVID-19 pandemic targeting ethnic minority communities (Objective 1). In line with the CBPR strategies underpinning this work, community partners were actively engaged throughout the study through activities such as: reviewing and informing the search strategy, involvement in the study screening process, involvement in study meetings, and review of study findings and report before dissemination.

3.1.1.2 Search strategy and analysis

Words related to physical activity, healthy eating, messaging and ethnic minorities were used to develop a scientific and grey search strategy together with a librarian and a team of experts collaborating on the study.

MEDLINE, CINAHL and Scopus were used to run the scientific search and various websites and platforms agreed with community partners were used to conduct the grey literature search. The search included messaging produced between 1st December 2019 and 30th September 2021. This period coincides with the start of the COVID-19 pandemic in the UK and the start of data collection for Study 2 which used findings from the review. All searches were conducted in English

because messaging available in other languages would often have an English language version which would have been identified in the English search.

Study selection was carried out in two stages for scientific literature (title and abstract, and full text), and one (full text) for grey literature by two independent reviewers, including the author. A third reviewer was available to resolve disagreements.

Resources restricted to scientific articles, government policies, guidance and reports, and content produced by national stakeholders in public health were included if they contained physical activity and healthy eating advice that targeted ethnic minority communities. Social media content, blog posts and media articles were excluded. Data on the author, title, type of literature, and the physical activity or healthy eating advice within the resources were extracted and managed using NViVo. Analysis involved grouping the physical activity and healthy eating advice into categories of messages.

3.1.1.3 Results

A total of 24 records were included in the review (Appendix A). Of these, eleven had messaging on both physical activity and healthy eating, four on just healthy eating and nine on just physical activity. Three main categories were found to summarise the included messages: i) physical activity; ii) healthy eating; and iii) risks.

Physical activity messaging focused on encouraging people to be active and educating people about the benefits of and recommendations for physical activity. Emphasis was on ways to be active around the home while keeping safe during lockdown. There were also messages on the mental health benefits of physical activity.

Healthy eating messaging also focused on encouraging people to eat healthy diets and its benefits to health. The links between diet, immunity and infectious diseases were emphasised and myths about the use of alcohol to fight the virus were debunked.

Compared to the other categories of messaging, messaging on risk was mainly targeted to ethnic minorities. Most messages focused on the higher risks of coronavirus infection among ethnic minority communities and the role of physical activity and heathy eating in reducing these risks. There was also emphasis on Vitamin D, its likely deficiency in those with melanin pigmented skin and links with immunity. There were messages on body weight, and suggestions on ways to lose weight healthily.

3.1.1.4 Discussion

This scoping review study found that although a plethora of physical activity and healthy eating messaging was produced during the COVID-19 pandemic (Zarocostas, 2020), only a small proportion of those produced by government and public health authorities specifically targeted ethnic minority communities. Findings correspond with other studies exploring IPC messaging which found that many government messages were not targeted and culturally appropriate to ethnic minority communities, and the few that were translated are often difficult to access (Scientific Pandemic Influenza Group on Behaviours (SPI-B) for the Scientific Advisory Group for Emergencies (SAGE), 2020; Kamal et al., 2020; Ala et al., 2021; Morales and Ali, 2021; House of Commons Women Equalities Committee, 2020).

Although words relating to ethnic minorities were used at least once in each of the 24 records, hence the reason for their inclusion, only little of the messaging within the record, mainly COVID-19 risk related information, was specifically targeted to ethnic minority communities. The physical activity and healthy eating messages addressed the general population. This may be problematic for ethnic minority communities. Evidence suggests that when physical activity and healthy eating messages are not tailored to specific population groups, they risk being irrelevant and accentuating existing inequalities (Lustria, 2017; Broekhuizen et al., 2012). Similarly, an evidence summary published by the Scientific Advice Group for Emergencies in September 2020 (Kamal et al., 2020) found that culturally tailored messaging increased the accessibility and acceptability of COVID-19 IPC messages to ethnic minority communities. Targeting messaging may have its disadvantages such as being perceived as stigmatising (Kamal et al., 2020) or making the common mistake of ignoring the diversity within different minority ethnic communities, however, it is important to ensure messaging stays relevant to the target communities (Lustria, 2017; Broekhuizen et al., 2012). Care needs to be taken to ensure these communities are actively involved in the message production process.

3.1.1.5 Conclusion

In conclusion, physical activity and healthy eating messaging specifically targeting EMCs during the COVID-19 pandemic were found to be limited. Considering the importance of appropriately designed messaging for improving these health behaviours, more work is needed to develop messaging tailored to UK ethnic minority communities.

3.1.2 Study 2: How were physical activity and healthy eating messages produced during the COVID-19 pandemic received by ethnic minority communities? A qualitative study

3.1.2.1 Study rationale and objectives

Study 1 found that physical activity and healthy eating messages tailored to ethnic minority communities was limited during the COVID-19 pandemic. Most of the tailored messages available were risk-based. It is important to understand how these messages were received by ethnic minority communities, to inform strategies for the use of public health messaging with these communities. Study 2 (Gafari et al., 2024a) (Appendix A) aimed to understand how different categories of physical activity and healthy eating messages were received by ethnic minority communities (Objective 2).

3.1.2.2 Methods

Semi-structured individual and group interviews were used for data collection (Section 2.2.2). Community engagement was embedded throughout the study through activities such as reviewing ethics documents and topic guides, partaking in study planning meetings, recruitment of participants and interpretation and review of study findings.

People aged >15 years, living in the UK and from ethnic minority communities were purposively recruited through visits to community groups, snowballing and social media. Written and verbal informed consent was received from all participants before data collection. Data relevant to this study is based on a subset of questions from the topic guide co-produced with project collaborators and community partners as part of the PAN-Co-POWeR project. Questions were as follows:

1) What general messages have you seen that promotes increase in physical activity and healthy eating during COVID-19?
2) Where did you find these messages?
3) Where do you look for these kinds of messages?
4) What did you think of these messages?
5) Do they make you want to be more active or eat healthy?

A total of 10 group interviews (n=2–6) and five individual interviews were run between July 2021 and March 2022. Interviews lasted between 60-90 minutes and were either online or face-to-face at agreed locations including a community group venue, a food bank and on a university campus. All interviews were facilitated by the author and co-moderated by colleagues who all had previous experiences of conducting interviews with people from ethnic minority communities. Interviews

were recorded, and anonymised transcripts were managed using NViVo-12. Two independent reviewers, including the author, carried out inductive thematic analysis to analyse the data and the research team reviewed and agreed on key themes, subthemes and quotes.

3.1.2.3 Results

A total of 41 participants, (21 women, 63% England resident) were interviewed. Over half (68%) identified as Black, Black British, African and Caribbean. Five main themes were identified: 1) lack of awareness of messaging; 2) responses to physical activity messages; 3) responses to healthy eating messages; 4) perceptions of risk messages and 5) perceptions of conflicting messages.

In agreement with Study 1 findings (Section 3.1.1.3), most participants could not recall seeing any physical activity and healthy eating messaging during the COVID-19 pandemic at the point of the interviews. For those who came across messaging, the majority of these were on physical activity with only a few on healthy eating for improved immunity. Most participants reflected, however, on risk messaging during the pandemic and how messaging was framed to suggest an inherent COVID-19 risk in their communities. Many young people discussed having reduced trust in the government due to government messages conflicting with government actions. An example was that although the message was to stay healthy, fast-food restaurants were prioritised over gyms during the easing of the national lockdown. Participants suggested that messages alone were not sufficient to improve these health behaviours in their communities; corresponding tailored interventions are needed. More details of these themes with illustrative quotes are available in Appendix A.

3.1.2.4 Discussion

This qualitative study found that public health messaging targeting ethnic minority communities were either entirely missed or, where received, was not interpreted as intended, agreeing with results from Study 1 that messaging was limited.

There are several possible reasons as to why messaging was missed by study participants. It could be, as was found in another study with young people from diverse ethnicities (Strömmer et al., 2022), that previous negative experiences with messaging have fuelled distrust, scepticism and avoidance of government messages (Razai et al., 2021). People were therefore shifting towards more trusted sources of messaging including community-based sources and social media. Greater trust in communities and religious leaders have been well documented in research among ethnic minorities (Mahmood et al., 2021; Kamal et al., 2020; Treweek et al., 2024).

Participants also reflected on how the government failed to provide relevant physical activity and healthy eating messaging, focusing only on COVID-19 IPC measures and vaccination. Young people highlighted that the government and public health authorities "*who were meant to help us*", left them to rely on other sources of information and social media, which sometimes were inaccurate. This indicates some contradiction; that although there are low levels of trust in the government, there is still some expectation that the government be responsible for relevant and reliable messaging. This could mean that the availability of more relevant government messaging may facilitate rebuilding trust as has been previously observed (McNulty et al., 2022). It could, however, mean that messaging creation and dissemination efforts should firstly focus on building trust with the target communities and working together to ensure relevance to their communities. (McNulty et al., 2022; UK Minister for Equalities and Race Disparity Unit, 2021; Quirk, 2024; Treweek et al., 2024).

Study participants found risk messaging to be discriminatory as has been observed in other studies (McNulty et al., 2022; Mahmood et al., 2021; Vandrevala, 2022). This negative framing of messaging perceived by participants may have bred a defensive response and may have led to negligence of subsequent messaging (Vandrevala, 2022). This creates a problem in trying to get the balance between developing culturally and ethnically relevant messaging and trying to ensure that messaging is not discriminatory. The most obvious solution to this problem is to ensure proper co-production of such risk messaging with the communities to which it is targeted.

Findings from Study 2 suggest that more work is needed to develop and disseminate public health messages relevant to ethnic minority communities.

3.1.2.5 Conclusions

In conclusion, physical activity and healthy eating messaging specifically targeting ethnic minority communities during the COVID-19 pandemic were either missed or not well received. Commitment to long-term engagement focused on building trust with these communities is important to ensure future messaging is well received.

3.2 Understanding the physical activity and healthy eating behaviours of UK ethnic minority communities

Developing effective and relevant interventions requires a solid understanding of the behaviour of interest in the context of the target population (Davidson et al., 2013; Nierkens et al., 2013; Skivington et al., 2021). It also requires a good understanding of the structural and systemic factors affecting the engagement of the target population with these health behaviours (Osei-Kwasi et al., 2016).

Many studies on the barriers to and facilitators of physical activity and healthy eating among ethnic minority communities have been conducted (Patel et al., 2017; Ige-Elegbede et al., 2019; Bhatnagar et al., 2021). These studies highlight lack of time, limited financial resources, lack of awareness, cultural barriers and religious beliefs as the main barriers to being physically active and eating healthily. However, these to some extent, reflect the priorities placed on physical activity and healthy eating. If more time and money were made available, would they be spent on being active and eating healthily? What would determine the answer to this question is an understanding of what these communities value. This is because people sometimes engage in behaviours detrimental to their health due to other non-health related values attached to the behaviour which overrides the health imperative (Kelly and Barker, 2016; Amos, 1995).

Values play an important role across the different levels of public health actions in the Nuffield Ladder of Intervention (Figure 3.1). People's values significantly shape how they will respond to interventions at various points along the ladder. For example, even when tax incentives are offered to encourage the use of a gym for physical activity (level 4 of the ladder), a person's willingness to give up the other activities they spend their time and money on for engaging in physical activity depends on their values.

Understanding the values and priorities of these communities is therefore essential to ensure interventions are tailored to meet their diverse needs and the varied cultural contexts they represent (Davidson et al., 2013). In this thesis, a previous definition of personal values by Worsley and Lea was adopted; "normative behavioural criteria or guiding principles in our lives" (Worsley and Lea, 2008)

This section reports a study that was conducted to better understand the physical activity and healthy eating behaviours of ethnic minority communities to inform the development of relevant interventions, policies and programmes.

3.2.1 Study 3: Values underpinning physical activity and healthy eating behaviours of UK ethnic minority communities: a qualitative study

3.2.1.1 Study rationale and objectives

Study 3 (Appendix B) was carried out to understand what mattered most to ethnic minority communities in relation to their physical activity and eating behaviours to inform the development of interventions that are relevant to their communities. The study aimed to: 1) identify the main values underlying physical activity and healthy eating behaviours among UK ethnic minority communities (Objective 3); and 2) explore how structural, social, economic and environmental

factors interact with these values and their influence on physical activity and healthy eating behaviours (Objective 4).

3.2.1.2 Methods

Individual interviews and focus group discussions were used to collect data. A purposive sampling approach was adopted to recruit people aged >15 years from ethnic minority communities living in the UK. Different means including face to face visits to community groups, use of recruitment posters, social media and snowballing were used to recruit participants (Gafari et al., 2024c).

A subset of questions from the topic guide for the PAN-CO-POWeR project developed with project collaborators and community partners was used in this study (Table 3.1) (Gafari et al., 2024c).

Table 3.1 Subset of questions taken from topic guide for interviews

Topic	Question	Sub questions and prompts
Experiences	What were your experiences over the past year with the COVID-19 pandemic?	Friends, families and community Health Physical activity Diet
Physical activity priorities	How important is being physically active to you?	On days you engage in physical activity or exercise, what kind of activities do you do? Why do you do that activity?
Healthy eating priorities	How important is eating a healthy diet to you?	Are there specific days/times/periods when you feel more motivated to eat healthily? Why? On those days, what do you eat?
Factors interacting with priorities	(Researcher provided a brief statement describing the government recommendations for healthy diet and physical activity.) In your opinion or experiences, how possible are these recommendations to achieve?	What specifically makes it possible/not possible for you to achieve these?
Support	What may best support you to achieve these recommendations for diet and physical activity?	

Data collection took place between July 2021 and March 2022 with interviews being either face-to-face or online. Face to face sessions took place at locations agreed with participants. All sessions were facilitated by the author and co-moderated by colleagues who all had previous experiences of conducting interviews with ethnic minority communities, being from these communities themselves. Interviews were recorded, transcribed, anonymised and checked against field notes to ensure non-verbal communication and accent differences were captured.

Inductive thematic analysis was carried out with particular attention given to latent concepts within the data (Appendix D).

3.2.1.3 Results

As in study 2, a total of 41 participants aged between 18 and 86 years living mainly in England and Wales were involved in this study. Over half were women and the majority (68%) were from the Black ethnic group. Representation from Asian and Mixed or Multiple ethnic backgrounds was lower across this PhD. While efforts were made to enhance diversity by working with community engagement partners from these underrepresented communities, these efforts only yielded minimal success.

Three main values underlying the physical activity and healthy eating behaviours were identified: 1) Culture and family; 2) Community and social life; and 3) Health. 'Routines' was also identified as a coping strategy that enabled participants to behave in a way that was consistent with their values. These values are briefly summarised below, with more details including example quotes available in Appendix B (Gafari et al., 2024c).

Culture and family values were observed across the different age and ethnic groups represented in the study. People perceived cultural meals as "good food" and not eating these foods made participants feel "sad". While participants acknowledged the negative health impacts of some of their cultural meals, it was not sufficient to change their eating behaviours. They were, however, open to having their cultural foods slightly adapted to make them healthier. For physical activity, participants described how activities such as fending for the family or encouraging their children to focus on education rather than sports was more of a priority to them. Family behaviours were influenced by other family members. A participant described how they were "under pressure" due to their children's dietary preferences and emphasised the need for health education for children in schools.

Belonging to and participating in activities of an ethnically diverse community or social group was common to most participants regardless of their ages or ethnicities. Participants considered these groups important due to the experience of belonging and inclusion they gained. Participants explained how the health benefits they got from some groups that organised health related activities were "secondary" compared to that "feeling of togetherness" they got from being a part of the group.

Many participants also valued the health benefits of eating healthily and being active, and in some instances, the importance of these behaviours was for weight management and "looking good". However, it appeared that the value placed on culture, family and community was more important.

"Routine" was a latent coping strategy observed in the data, which facilitated how participants engaged with their values. Participants had created routines that helped them accommodate their multiple responsibilities while prioritising things that matter to them. New behaviours or activities that involved disrupting these "routines" were not well received.

This study also found two main factors affecting how the identified values shaped the physical activity and healthy eating behaviours of ethnic minority communities. The first of these was racism. This was mainly observed among participants of Black African ethnicity. Past, present and fear of future experiences of racism and discrimination shaped participants' behaviours. One participant, for example, described how her experience of being treated differently by people who believed "darker skin colours were the spreaders of the virus" kept her from taking her usual "walks in the park". The second factor was access. This factor interacted with racism. For example, although appropriate facilities for physical activity were available in some participants' neighbourhoods, they chose not to use them to avoid facing racism. Participants also reflected on how expensive healthy eating was and how even though they wanted to eat healthily, the costs of the meals made it impossible for them to do so.

3.2.1.4 Discussion

Using a qualitative approach, this study identified the values underlying physical activity and healthy eating behaviours to be culture and family; community and social life; and health. The study also found that racism and issues of access constrain people's ability and capacity to be physically active and eat healthily.

Similar to our findings, previous studies have highlighted the important role culture (Osei-Kwasi et al., 2016; Chatham and Mixer, 2020; Lee et al., 2023; Ojo et al., 2023a) and family (Ojo et al., 2023b; Asamane et al., 2019) play in the diets of people from ethnic minority communities. Culture has been defined as transmissible non-genetic guidelines available and accessible to a group of people as the right way to live (Kashima, 2014). Some participants were open to changes in the way their cultural meals were being made to make them healthier but were also keen to avoid a complete change in their diet. This emphasises the value attached to culture but also suggests an opportunity for public health intervention involving the co-production of healthy adaptations to cultural foods in an acceptable way.

Cultural barriers to using physical activity spaces, especially among women from ethnic minority communities, is a common phenomenon highlighted in past studies (Ige-Elegbede et al., 2019; Koshoedo et al., 2015; Patel et al., 2017). Contrarily, this phenomenon was not mentioned at all by participants in our study. It could be that participants had closed their minds to the use of public spaces for physical activity that such conversations are no longer relevant due to issues

previously described in research such as sexual harassment (Slater and Tiggemann, 2010; Peng et al., 2023), threats to safety (Peng et al., 2023), cultural acceptability of different sports (Mahmood et al., 2022) and sociocultural roles for women (Bhatnagar et al., 2021; Patel et al., 2017). The first two of these issues are common to women of all ethnicities, while the last two, specific to women from ethnic minority communities. This introduces an intersectional constraint to engaging in physical activity in public spaces among some women from ethnic minority communities, hence such kinds of interventions may not be well received.

Research has also shown the importance of community and social groups for behaviour change among people from ethnic minority communities (Jepson et al., 2012; Rawlins et al., 2013; Knifton et al., 2010). Study 3, however, found that the value placed on community and social support went beyond just behaviour change but on the feelings of belonging and inclusion participants drew from those groups (Gafari et al., 2024c). Although various kinds of groups were referred to by participants including sou-sou (money contribution) groups, sports groups, holiday groups, what they had in common was that they were all ethnically diverse.

Health was identified as a priority to participants in this study, especially as many of them were aware of the higher risks of diseases they had because of their ethnic backgrounds. This health consciousness sometimes drove participants to adopt healthier behaviours; however, this was often short-lived. As in the case of one participant who used diet apps and YouTube videos to lose weight, it could be that the adopted methods which were the most accessible to them, was not aligned with other values they had. This led to one value overriding the other. This highlights the importance of ensuring future interventions align with the fundamental values of the target population.

Similar to the findings from the present study, several studies have identified the impact of racism and socio-economic factors on physical activity and healthy eating behaviours, as well as the overall health of ethnic minority communities (Chowbey and Harrop, 2016; Jepson et al., 2012; French et al., 2019; Farrell et al., 2014). All these environmental factors which lie beyond the control of the individual need to be taken into consideration when developing programmes to improve health (Gafari et al., 2024c; Ojo et al., 2023a).

3.3 Engaging ethnic minority communities in public health research

3.3.1 Study 4: Co-produced strategies for building trust and engaging ethnic minority communities in research

Studies 1, 2 and 3 all highlighted the importance of engaging ethnic minority communities to improve their physical activity and eating behaviours. This final study (Study 4) was carried out to explore ways though which ethnic minority communities can be engaged with in a meaningful way to build trust and increase their inclusion in public health actions with the example of public health research. Study 4 addresses the final objective (Objective 5) of the PhD. The full paper published as a commentary (Gafari et al., 2024b) is available in Appendix C.

3.3.1.1 Rationale and objectives

As discussed in Section 1.4, the importance of carrying out research with active public involvement has been emphasised for improving the quality and impact of health research (Hickey et al., 2022). There has also been a high-profile agenda to increase diversity within PPIE and research (National Institute of Health Research, 2021; Reynolds et al., 2021). However, it is well known that UK ethnic minority communities continue to remain underrepresented (Etti et al., 2021; Dawson et al., 2018) and where represented, tokenistic (Ekezie et al., 2021).

There are many potential reasons for this non- and sometimes tokenistic inclusion, with an important one being inadequate knowledge among practitioners and researchers on how to effectively engage with people from these communities (Dawson et al., 2018; Ekezie et al., 2021; INVOLVE, 2012). Although there are many best practices for PPIE, these are often difficult to implement in real life situations. For example, issues relating to race, discrimination or biases sometimes arise during research conversations making some researchers feel uncomfortable and unsure about how to handle such issues. There are also many instances where researchers have sought to engage diverse communities but have taken approaches which may have been perceived as tokenistic (Gafari et al., 2024b), limiting the usefulness of those activities. A common example is where people from ethnic minority communities are invited to an hour-long advisory panel meeting but only about 5-10 minutes are left for discussion. Another example is where a five-page research document is sent to PPIE partners for review just a day or two before the document is needed; partners may end up approving the document without a sufficient review to avoid being responsible for delaying. These are all real-life examples observed by the author.

More published guidance on strategies to engage with these communities using real life examples are needed. This final paper was, therefore, co-written with public partners and aimed

to describe six main strategies which were key to building trust and increasing the inclusion of ethnic minority communities in the PAN-Co-POWeR project.

3.3.1.2 Strategies for building trust and increasing inclusion

The six strategies presented in Figure 3.2 are summarised below.

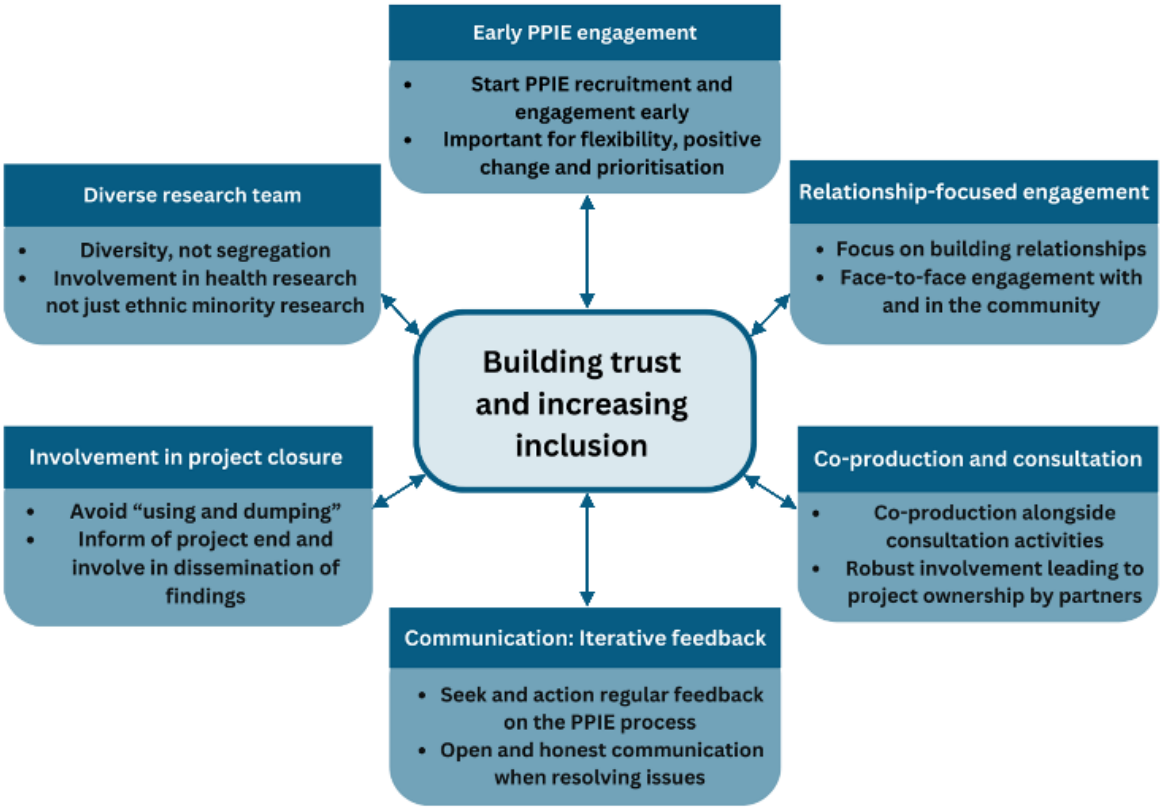

Figure 3.2 Six strategies for building trust and increasing inclusion (Gafari et al., 2024b)

1) **Early recruitment and engagement of PPIE partners:** It is important for members of the population (whether from the general public or from specific patient groups) being studied to be included in the early phases of research prioritisation and decision making (National Institute of Health Research, 2021). In some cases, this means efforts to engage with key stakeholders before a research idea is developed, and funding acquired. In many cases, however, the starting point is after funding has been awarded. In such instances, immediate efforts to begin recruitment and engagement with the appropriate community is recommended. This strategy is important to allow enough time and flexibility for suggestions from public partners to be adopted or implemented during the study. For example, it was through these early engagement activities undertaken in the PAN-Co-POWeR project that a more effective recruitment strategy to reach more people from ethnic minority communities, was adopted following suggestions from the early PPIE partners.

2) **Relationship-focused engagement:** This involves engaging with the public face-to-face in their community settings with the primary aim of building relationships; "out *with* the community *in* the community" (Gafari et al., 2024b). This approach to recruitment ensures a shift in the outcomes of community engagement and PPIE from helping researchers address research objectives to steering research in a way that is relevant to the needs of the community. People also value being engaged with, in their own environments and on their own terms, which facilitates trust, openness and a commitment from them to support the research. For example, useful feedback received during a community visit during the PAN-Co-POWeR project, was from a partner who mentioned that generic emails addressed to 'all' made them unsure whether they had to respond and, in some instances, made them feel excluded from the 'all'. Emails were personalised thereafter.
3) **Effective engagement involves both consultation and co-production:** Consultation activities, where researchers seek feedback on specific aspects of their research from the public, is one of the simplest ways to include PPIE in research (Shippee et al., 2015). However, these activities need to be carried out alongside co-production (Staniszewska et al., 2018). Frequent challenges associated with consultation activities, such as contrasting opinions among partners and choosing approaches to gain consensus, can be managed when partners have been actively engaged throughout the project through co-production. In PAN-Co-POWeR, this was achieved through involvement of the five core PPIE partners in planning and decision-making meetings, opportunities to co-chair meetings with researchers, developing and reviewing project documents and jointly facilitating discussion sessions with the public. An example of how researchers worked with PPIE partners to plan a public engagement activity during the project is presented in Appendix C.
4) **Iterative feedback and fostering open communication:** Although the engagement process actively involves researchers receiving feedback on their work to ensure its relevance, another important strategy to improve engagement is seeking and receiving feedback on the engagement process. This helps to ensure public members have a rewarding experience and it can facilitate trust as they see that researchers are committed to giving them positive experiences. In PAN-Co-POWeR, this was achieved by regularly asking PPIE partners how they felt about the engagement process and their suggestions on how it could be improved. This strategy also involves being open about the suggestions they provide which cannot easily be addressed. For example, a request was made to remove important sections of the data protection information in the participant information sheet. This was not possible, but the problem was addressed by having an open conversation with partners to discuss why it could not be changed as it was part of

the General Data Protection Regulation (GDPR) governing research in the UK and Europe. After they understood the constraints, a solution to the problem was co-developed and agreed on; the project offered phone calls to potential participants to explain the content of the information sheet.

5) **Active involvement of PPIE partners in project closure activities:** A major complaint reported by those who had been involved in research in the past was that the results and outcomes of the research project were not always communicated to them. They described this as being "used and dumped" by researchers (Gafari et al., 2024b; Ocloo and Matthews, 2016; Ocloo et al., 2021). In PAN-Co-POWeR, a transformative action workshop was planned with members of the public (Appendix C). Active involvement of PPIE partners in closure activities could result in benefits that outlast the span of the project and can result in the sustainability of PPIE; people become more likely to engage and are more likely to invite others in their communities to do so (Gafari et al., 2024b).
6) **Importance of a diverse research team**: Diversity within the research team is important for inclusion and diversity of participants within the research project (National Academies of Sciences and Medicine, 2022; Sharma and Palaniappan, 2021; Bodicoat et al., 2021). In PAN-Co-POWeR, having investigators and researchers from ethnic minority backgrounds in the team was valued by the ethnic minority communities engaged with. However, emphasis was placed on the importance of diversity and not segregation. Ethnic minority communities should be included routinely in research studies of the general population, as both participants and researchers, and not just in studies focused on ethnic minorities.

In the published paper (Appendix C), a section containing reflections from PPIE partners engaged in the project and their recommendations to both researchers and members of the public were included.

3.3.1.3 Effects of adopting the six strategies in PAN-Co-POWeR

Using the case study of the PAN-Co-POWeR project, the outcomes of using these six strategies are presented in Table 3.2 (Gafari et al., 2024b).

Table 3.2 Outcomes of adopting six engagement strategies in the PAN-Co-POWeR project (Gafari et al., 2024b)

Outcome	Description
Inclusion of ethnic minorities	Widespread inclusion of ethnic minority communities (six PPIE partners and 48 research participants from Asian, Black and Mixed ethnicities, aged 18 to 86 years)
Trust-building	Evident in the active participation of people who had initially declined to take part in the project.

Community wellbeing and impact	Qualitative feedback indicated that study participation increased confidence, wellbeing and willingness to engage in future research among research participants and PPIE partners. Example quote: "*I heard someone refer to us as hard to reach groups but now this project has given me the confidence to speak up and tell them that PAN-CO-POWeR did it. They reached us and made us feel valued. Other projects can do the same"* PPIE co-author.
Co-production	Active engagement and support to ensure project aims were achieved. Co-production of messaging (posters) and strategies to improve physical activity and healthy eating among ethnic minority communities in the UK.
Active engagement	Four PPIE partners from PAN-Co-POWeR and 14 from the Co-POWeR consortium attended a policy event at the UK Houses of Parliament in Westminster in June 2022 to co-disseminate project recommendations with policy makers.(Solanke et al., 2022) Four PPIE partners (one virtually) also attended the final project conference in Leeds in January 2023.
Consortium-wide impact	Overall enrolment of 51 PPIE partners from ethnic minority communities across the Co-POWeR consortium (overseen by Southampton PPIE Unit) achieved by joint efforts by the researchers and PPIE partners across institutions in the consortium
Future engagement of PPIE partners	Following recommendations for continuity of engagement by PPIE partners, an initiative was set up (with internal funding from the University of Southampton) to co-produce a PPIE database of partners from ethnic minorities, termed the Co-DICE project (Co-production of a diverse community engagement database). The purpose was to support development of research projects by enabling more diverse PPIE to better reflect the general population in research.

3.3.1.4 Conclusions

Effective engagement with communities can be challenging, and time and resource consuming. However, as this level of engagement is important because it has multiple gains for both the project and society, adequate planning and costing are required right from the start of research studies to ensure engagement can be prioritised and successfully achieved. An unwillingness to take part in research has often been regarded as the reason behind underrepresentation among ethnic minority communities (National Academies of Sciences and Medicine, 2022), but this thesis has shown that this is not the only possible reason. With appropriate strategies, inclusion and diversity can be achieved in public health research and practice.

Chapter 4 Discussion and Conclusions

4.1 Summary of PhD Findings

This PhD aimed to engage UK ethnic minority communities in developing strategies to improve their diets and increase their physical activity using community based participatory research principles. Public health interventions including messaging, behaviour change interventions and public health research are widely used strategies for improving population health in the UK. Historically, ethnic minority communities have been exposed to injustices and face disadvantage in both health and social care. Yet, they have consistently been found to have lower engagement with public health interventions and research. Through this thesis, ethnic minority communities were engaged in a process to help researchers, policy makers and public health practitioners understand how best these public health efforts can be developed and implemented to serve them better. Studies 1 and 2 focused on messaging, Study 3 on public health interventions focused on behaviour change and Study 4 on public health research.

Studies 1 and 2 explored the effectiveness of existing messaging to improve physical activity and healthy eating among these communities. These studies were carried out in the context of the COVID-19 pandemic, when attention was being re-focused on the health of ethnic minority communities. Through a scoping review, Study 1 identified the physical activity and healthy eating messaging tailored to ethnic minority communities available during the COVID-19 pandemic. The study showed that compared to generic messaging, physical activity and healthy eating messaging tailored to ethnic minority communities was limited. The few messages available generally covered three categories: messaging to promote physical activity, messaging to promote healthy eating; and messaging on health risks specific to ethnic minority communities. Of these three categories, messaging on risk was the most abundant and the most tailored to ethnic minority communities.

Study 2 was carried out to understand whether this physical activity and healthy eating messaging during the pandemic was received by ethnic minority communities as intended and how future messaging may be made more relevant to ethnic minority communities. Confirming the findings of Study 1, Study 2 found that available messaging during the COVID-19 pandemic was either missed completely, or where seen, was not well-received. Study participants also responded negatively to health risk-based messaging intended to alert people from ethnic minority communities to their raised risk of infection and found some of the messaging they accessed to be conflicting with government actions, hence not worth accepting. For example, study participants found government messaging to stay healthy during the COVID-19 pandemic to be

undermined by the government's decision to re-open fast-food shops while gyms and places of exercise stayed shut. Ultimately, participants identified that messaging did not reflect their priorities and values and, emphasised the need for community engagement when messages are being developed to ensure they are relevant to their communities.

Messaging alone is not sufficient to result in adoption of positive health behaviours. It was, therefore, important for this PhD to explore how interventions complementing messaging may also be made relevant to ethnic minority communities. Study 3 was a qualitative study carried out to explore what mattered most to these communities with respect to physical activity and healthy eating behaviours. The study revealed why generic messaging about physical activity and healthy eating was not well-received by ethnic minority communities. Study 3 identified the three main values underlying the physical activity and healthy eating behaviours of ethnic minority communities. These were: 1) culture and family; 2) community and social and 3) health. 'Culture and family' were interlinked in the way participants discussed them as were 'community and social'. The value these communities placed on culture and family aligns with the priority placed on the need for culturally appropriate messaging identified in Study 2. The importance of community and social gatherings explained why community and religious sources of information were often more trusted than government messaging, which seemed alien and remote to them. Study 3 also made it clear that ethnic minority communities value health and actively seek health messaging, but sometimes they resort to social media when messages from authorities are lacking, irrelevant or delayed.

Racism and socio-economic and geographical access to resources enabling physical activity and healthy eating (e.g. avoiding nearby green spaces due to fear of being policed or discriminated against, high cost of healthy foods) were key factors that influenced how communities engaged with physical activity and healthy eating behaviours. Again, participants highlighted the need for policy makers, practitioners and researchers to engage their communities to co-produce interventions which aligned with these values.

Findings from all three studies emphasised the need to engage with communities, yet evidence suggests that these communities are not effectively engaged in public health activities. Study 4 was carried out to explore the mechanics of engaging ethnic minority communities in public health activities, using the example of public health research, though findings may be applicable to other public health activities.

Study 4 was a commentary co-produced with public contributors as co-authors, following a review of methods used during the PAN-Co-POWeR project and the outcomes identified six strategies that were key to building trust and increasing the involvement of ethnic minority communities in research. These were: 1) early recruitment and engagement of PPIE partners; 2)

relationship focused engagement; 3) use of both consultation and co-production activities during engagement; 4) iterative feedback and open communication; 5) active involvement of PPIE partners in project closure activities; and 6) the importance of a diverse research team.

This PhD offers evidence of the need for community engagement and co-production with ethnic minority communities when developing and implementing public health actions to improve their physical activity and healthy eating behaviours. Community engagement if carried out well will create public health activity more likely to reach, and be heard by, ethnic minority communities, and therefore to improve their health and well-being.

The 'golden thread' of meaning and connection which runs through this PhD thesis, and which is central to effective engagement of ethnic minority communities in physical activity and healthy eating is illustrated in Figure 4.1. Each of the four columns refer to the four studies that make up this PhD. The lighter shaded boxes are the research questions within the studies, while the darker shaded boxes are the key findings from the studies.

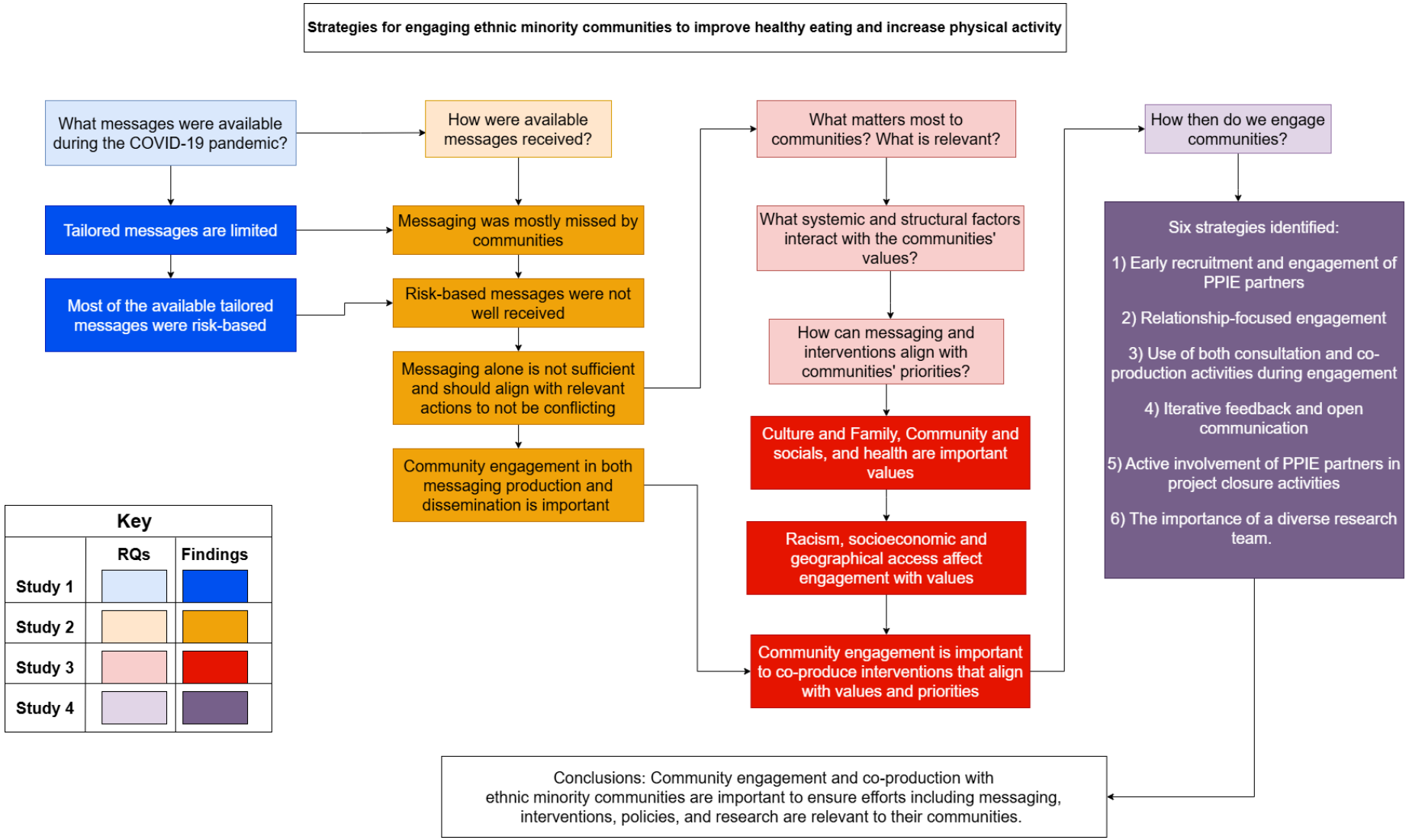

Figure 4.1 Golden thread of meaning and connection across the PhD
Abbreviations: RQs: Research Questions

4.2 Contributions to research

Findings from this PhD addresses research, and policy gaps and contributes to the evidence-base for strategies to increase engagement of ethnic minority communities in being active and eating well. The thesis also provides information on how to make physical activity and healthy eating promotion activities, including messaging, behaviour change interventions and policies, and research more relevant to these communities.

Previous studies have shown the importance of tailoring public health interventions to ethnic minority groups for improved accessibility, acceptability and adoption of the health behaviours being promoted (Elaine et al., 2021; Koval et al., 2022; Martinez et al., 2013; Williamson et al., 2020; Kessels et al., 2011; Kalocsányiová et al., 2023; Kamal et al., 2020; Lustria, 2017). This thesis, however, found that tailored physical activity and healthy eating interventions, including messaging during the COVID-19 pandemic were limited in line with previous studies (Ekezie et al., 2022; Goldsmith et al., 2022; Frisch-Aviram et al., 2023). Similarly, a large body of evidence shows the disadvantages of using negatively framed risk messaging, especially for marginalised communities as it promotes a defensive mechanism which prevents people taking preventative steps and hence perpetuates inequalities (Ryan et al., 2021; Francis and West, 2023). Findings from this thesis, however, suggests that these kinds of messages were the most available to ethnic minority communities. It is true that ethnic minority communities are at higher risk of some long-term conditions, however, when all messaging is focused on is targeting those communities with such risk information, it may have negative effects. Risk messages were not well received and perceived as stigmatising by the participants in the studies included in this thesis, as highlighted in section 3.1.2. Another study however found that positively framed messaging delivered through government sources bred suspicions because they thought important information about the risks of engaging in the promoted behaviour were being purposefully withheld from them (Woolf et al., 2021). There exists a challenge to balance the need for tailored messaging against the possibility that such messaging may single out communities and be perceived as stigmatising (Kamal et al., 2020). This can be achieved by ensuring tailoring is done appropriately and not as a tick box exercise which is often the case (Kalocsányiová et al., 2023).

There is a difference between developing interventions targeted at ethnic minority communities and tailoring those interventions. Whereas targeting involves aiming interventions at a particular population subgroup, tailoring involves ensuring those interventions are adapted to suit the specific needs and context of the target group (Schmid et al., 2008; Pasick, 1997; Kreuter and Wray, 2003). For example, leaflets encouraging people to eat healthily may be distributed in an African food shop as a means of targeting the African community, but if the leaflet itself portrays

healthy eating as eating "*salad*" instead of the "*good hard food*" they value (Gafari et al., 2024c) (section 3.2.1), it becomes hard for them to relate to and adopt the health behaviour such messaging promotes. Similarly, although all the records promoting physical activity and healthy eating found in the scoping review (3.1.1) mentioned ethnic minority communities, only a few of those records had health promoting messaging tailored to these communities. A 2022 systematic scoping review also found that records that claimed to have tailored messaging referred to adjustments in only one or two of the eight key aspects of message tailoring (Kalocsányiová et al., 2023). Drawing from findings from Study 2 (3.1.2.3) and various community engagement discussions had with community partners (Gafari et al., 2024a; Gafari et al., 2024b), examples of practical actions that can be adopted when tailoring messages for different ethnic minority communities in line with the eight key aspects of message tailoring are presented in Table 4.1

Table 4.1 Aspects of message tailoring and examples in practice

Aspects of message tailoring (Kalocsányiová et al., 2023)	Examples of what this may look like in practice
Language	Translating messaging to a different language
Accessibility	Having audio-versions of document
Content relevance	Using example of a cultural food
Framing	Positively framed messages highlighting benefits
Appeal	Using the image of a person from an ethnic minority background as cover page
Channel	Community or religious dissemination channels
Source and messenger	Community leader
Trust building	Use of respectful and kind messages

It is important to ensure that policies and programmes are well tailored to ethnic minority communities. However, adequate tailoring requires an understanding of the population of interest and their values i.e., what matters most to them. Findings from this PhD provides insights into this understanding (section 3.2.1.3).

In line with PhD findings, previous studies have identified the importance of culture (Osei-Kwasi et al., 2016; Chatham and Mixer, 2020), family (Ojo et al., 2023b) and community and social factors (Asamane et al., 2019; Ojo et al., 2023b; Ojo et al., 2023a; Patel et al., 2017) in the health related behaviours of people from ethnic minority communities. As in all traditional communities, eating in ethnic minority communities goes beyond the ingredients but is experienced as the combination of the way it is prepared, the involvement of family and community in the preparation and eating process, how it tastes, the significance of the time it is eaten and who it is shared with (Ojo et al., 2023b; Ojo et al., 2023a). Similarly, the value placed on community and social life extends beyond the motivation, support and encouragement for healthy living drawn from other community members. Participants specifically emphasised that it was that feeling of inclusion,

and freedom to 'just be' they had while belonging to and engaging with a community or social group that was important to them. Public health interventions which prioritise enabling people to experience these values of inclusion and acceptance are therefore more likely to resonate with these communities and promote their engagement, resulting in improved intervention outcomes and reduced inequalities.

Culture is dynamic and transmissible (Kashima, 2014) meaning that some cultural norms can change over time (Gafari et al., 2024c). For example, with urbanisation and technological advancements, some cultural norms relating to food are undergoing adaptations; study participants accepted that they were willing to try new methods of cooking which did not tamper with the essence of their cultural meals. There are also aspects of culture that people do not accept or endorse and so oppose in their daily lives (Tam and Chan, 2015). This means that although culture is valued and interventions to improve physical activity and healthy eating among ethnic minority communities should align with this value, care needs to be taken to ensure such cultural adaptations for health are acceptable to the community and not considered disrespectful as has been expressed by a participant in another study (Asamane et al., 2019).

It is important to ground this understanding of what matters most to communities to aid tailored interventions in the fact that ethnic minority communities are not a homogenous group. As is the case with all other population groups, humans are complex beings and a wide array of factors e.g., religion, gender, parental experiences, education, socio-economic background, race etc., complexly intersect to drive our behaviours, priorities and values. This highlights another key finding in this thesis which is the need to engage different communities through co-production when developing policies and programmes. Interventions that are co-produced with communities better reflect the needs and realities of those communities, thus leading to interventions which are more relevant, meaningful and accessible to them (De Rosis et al., 2020; Hanlon et al., 2023).

Adequate community engagement requires trust (Gafari et al., 2024b). Several studies have shown that ethnic minority communities were more open to engaging with health interventions when they came from sources they trusted including community groups or leaders and religious groups (Mahmood et al., 2021; Kamal et al., 2020; Strömmer et al., 2022). There is a contradiction in the data on trusted sources and health messaging; studies have demonstrated low levels of trust in the government and health authorities among ethnic minority communities, yet a study also found that these communities consider interventions and information from the government and health authorities as 'official' (Strömmer et al., 2022). Participants involved in the studies included in this PhD reflected on how the government and relevant health authorities "*who were meant to help"* them failed to address their needs and left them to rely on other unofficial sources

of information which they were aware may not have been accurate. This could mean that although due to previous experiences, levels of trust are low, a commitment to working with these communities developing relevant interventions may facilitate rebuilding trust among these communities. This has been observed before (McNulty et al., 2022). Efforts to build trust such as committing to co-production may also need to be invested in as a first step to ensure the acceptance of health related interventions (Mahmood et al., 2021; McNulty et al., 2022; Kamal et al., 2020).

4.3 Implications for public health policy and practice

The findings from this PhD have implications for public health policy and practice. Firstly, evidence from this PhD show that much effort is still needed to ensure public health messaging is relevant and suitable for ethnic minority communities and that they trust what they are being told. Using study findings, Table 4.2 (Gafari et al., 2024a) was developed which presents six recommendations for public health researchers, policy makers and practitioners to take into consideration when developing physical activity and healthy eating messaging for ethnic minority communities.

Table 4.2 Recommendations for improving the impact of public health messaging for ethnic minority communities – The Six Ts of messaging (Gafari et al., 2024a)

Topic	Recommendation
Together	Togetherness underpins all other recommendations. To facilitate greater acceptance of public health messaging, co-production with community and e.g. religious groups should be adopted as a strategy by the government, building on trust that already exists within these groups.
Trust	Prioritise actions to rebuild trust within ethnic minority communities by actively working with and building relationships with community groups and leaders. Engage them in communicating health messaging to their communities. These actions should be consistent and sustained efforts demonstrating commitment to trust building.
Tailoring	Tailor health promotion messages to the needs and realities of communities. This tailoring goes beyond just mentioning these communities or including images of them in messaging. Communities need to be actively involved in the development and dissemination of the messaging to avoid the risk of messaging being perceived as stigmatising.
Timing	Work with social media platforms and community groups to provide speedy, reliable, and accurate information targeted to relevant communities. This messaging needs to be produced rapidly to avoid the risk of people being exposed to persuasive misinformation as the first thing they hear or read. It also needs to be clear, accurate and precise to prevent confusion.

Tone	Messaging needs to be considered carefully. This may best be achieved by co-producing messages with specific ethnic minority communities.
Truth	Government and public health authorities should be true to the messaging they are promoting and act in a way that is consistent with that messaging.

In terms of policy and programme development, findings from this PhD have shown that available public health programmes may be made more effective and relevant to ethnic minority communities through continuous engagement with these communities, and by aligning them with the values underpinning their behaviours while considering factors which may prevent them from engaging with those values.

For example, the "Community Eatwell" programme recommended by the National Food Strategy involves the prescribing of fruit, vegetables and education programmes on food skills by general practitioners to members of the public (Dimbleby, 2021). In line with evidence from this PhD, this programme may potentially be made more relevant to ethnic minority communities by: i) the prescribed fruits and vegetables reflecting various cultural foods; ii) integrating education programmes into existing ethnically diverse community groups; and iii) providing guidance on how to incorporate physical activity and healthy eating into daily routines. Ultimately, to ensure this programme is made more relevant to a specific ethnic group, then members of that group need to be involved in the development, implementation and evaluation of the programme.

Three questions policy makers, practitioners and researchers can ask themselves during the programme and policy planning process are presented in Figure 4.2.

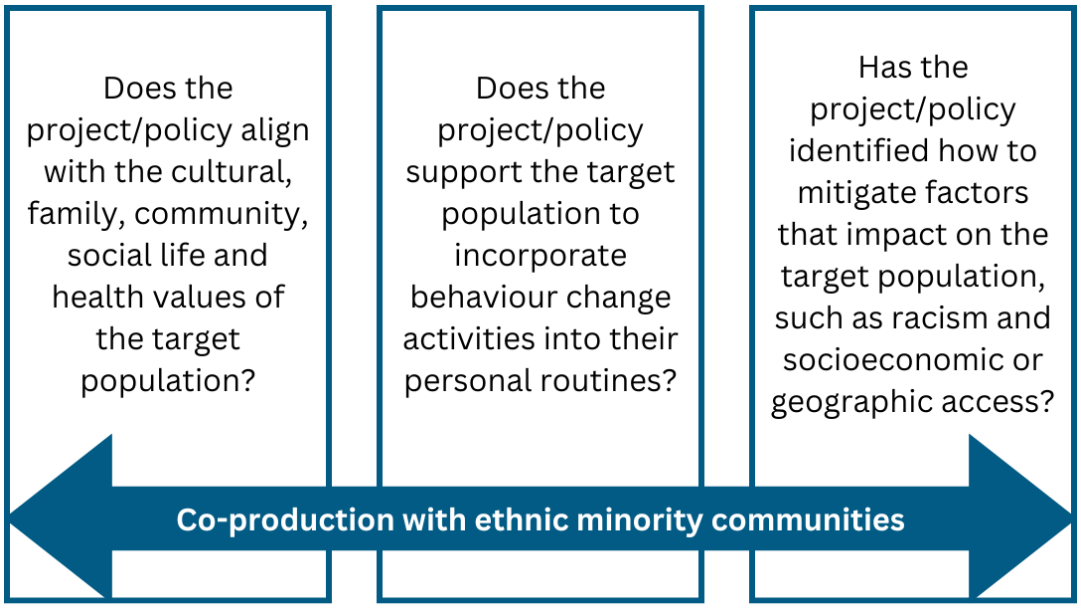

Figure 4.2 Guide questions when planning physical activity and healthy eating policies and programmes (Gafari et al., 2024a)

A demonstration of how these questions can be used in practice when planning a physical activity programme promoting cycling is presented in Table 4.3

Table 4.3 Example of using guide questions when developing a physical activity programme

Programme	Suggested questions based on guide
Cycle lanes to promote physical activity	1) Is it usual cultural practice for target population to cycle? Can cycling be done with family, community or friends? What health benefits are associated with cycling?
	2) Can cycling be incorporated in the day-to-day lives of target population? How and what would this look like for them?
	3) Will issues such as access or racism inhibit target population from using the lanes? For example, would they have the financial ability to purchase a road safe bike and other cycling gear?
Following co-production activities with the community using these guide questions, the next step can be decided on with the community. It could be that although cycling is not normally part of the culture of the community, they might be open to trying the activity in their community groups as a way of socialising; hence a community cycling programme could be co-created. It could however also be that they are completely uninterested in cycling and would prefer a community walking programme. The choice of what programme to implement and how it will be implemented needs to be decided upon by the community.	

The six strategies used to improve engagement with ethnic minority communities presented in this thesis (section 3.3.1.2) are also recommended for use to ensure a diverse group of people are involved in co-production activities. Although co-production is important, non-diversity in co-production activities may contribute to health inequalities as the co-produced interventions may risk being irrelevant to the different groups within the community.

Although participants involved in this PhD are not representative of the entire ethnic minority population, the application of the findings from this PhD to public health policy and practice remains valid and are not limited to specific groups. Across all implications discussed in this section, the most important initial step is identifying the specific target population for policies and interventions and then working collaboratively through co-production with those communities to ensure the policy or intervention being developed is relevant and suitable. This is a general principle that applies across communities and is not limited to any particular ethnic group.

4.4 Future research

This PhD thesis has resulted in the development of the six Ts of messaging (Table 4.2), a guide for developing interventions (Figure 4.2) and six strategies for building trust and engaging underserved communities (Figure 3.2). Although these outputs were co-produced with members of the community, future research is needed to evaluate the effectiveness of using these strategies with UK ethnic minority communities to improve their health. A review of the literature

suggests that evidence of the effectiveness of co-produced interventions to improve health with ethnic minority communities is lacking (Health and Care Excellence, 2016). Such research will need to be grounded in CBPR principles to ensure it prioritises the communities as agents of their own health and, remains relevant to the communities' needs and contexts (Israel et al., 1998; Israel et al., 2008).

Based on findings and recommendations of this thesis, future research will necessarily emphasise community engagement. A typical research project will involve three phases as presented in Table 4.4.

Table 4.4 Phases of a potential future research programme

Research phase	Ways through which community could be engaged
Prioritisation and co-development	Members of the community, researchers, public health practitioners, policy makers, community organisations and other relevant key stakeholders come together to set the priority for physical activity and nutrition interventions and co-develop a feasible programme to address the identified issues
Implementation	The co-developed programme is implemented with active involvement of the community;
Monitoring and evaluation	All aspects of the programme including engagement with the community and the co-developed programme activities and outputs are frequently monitored and evaluated.

This research programme will establish the effectiveness of using the strategies in engaging ethnic minority communities to improve their health; and consequently, the impact of programmes fully co-developed with ethnic minority communities on their health.

Most study participants and community partners involved in the studies in this thesis were from an African or Asian background, therefore, further research is needed with other underserved communities, with attention given to the intersection of different characteristics including gender, socio-economic status, religion, nationality, disability and ethnicity.

Policy level changes are required to support the recruitment of a more diverse workforce; reflecting the diversity of the populations they serve. Similarly, policy changes that mandate inclusive public health processes and involvement of communities in the development and implementation of interventions will be useful in ensuring these positive practices are widely adopted. The recent policy by the NIHR mandating researchers applying for future funding to discuss how they plan to ensure diversity and inclusion in their work (National Institute for Health and Care Research, 2024) is a positive one, that would potentially improve the way research and other public health activities are conducted.

4.5 Strengths and limitations of this PhD

This thesis provides insights into ways through which ethnic minority communities can be engaged to improve their physical activity and eating behaviours, directly addressing gaps in existing evidence presented in Chapter 1 (section 1.5). These insights can guide policymakers, practitioners, and researchers in developing potentially more effective and relevant physical activity and healthy eating programmes and policies than those currently in place. A major challenge usually faced by researchers and practitioners alike is how these communities can be effectively engaged in health research and programmes. This PhD has provided strategies and demonstrated their success in addressing these challenges.

Each of the studies underpinning this PhD had their strengths and limitations. Across the various studies, the choices of methods used was a strength. The systematic scoping review allowed for the inclusion of records from a wide variety of both scientific and grey sources. The use of focus groups and interviews moderated by the researcher who is an experienced and trained qualitative researcher, also from a visible ethnic minority community, facilitated trust within the discussions and allowed participants to freely express their views and opinions.

A major strength of the overall research was the CBPR methodology underpinning the various studies. Historically, there have been many examples of power imbalance in research which have contributed to distrust among marginalised populations (Beatrice et al., 2021). The CBPR methodology (see section 2.2.2) addresses these by acknowledging communities' as active agents of change within their community and facilitates a partnership approach, therefore contributing to building trust. Through the CBPR principles adopted in this PhD, the different research studies were shaped to focus on what mattered most to the communities which contributed to increased engagement with the community. This allowed the studies and findings to truly reflect their realities and cultural contexts and, to an extent, validates the suitability of the recommendations when working with ethnic minority communities.

The main limitation of this PhD was in the lack of diversity of study participants and community partners. Although the studies were rooted in participatory research and members of the community were actively involved, most of the study participants were from Black African and Caribbean backgrounds. Being from a Black African background may have influenced the recruitment process and contributed to higher levels of participation from Black African communities. A potential strategy to improve engagement with other communities would be to involve gatekeepers and community engagement partners from those communities. This strategy was adopted to an extent with some of the community engagement partners engaged in the study identifying as being Asian or having mixed or multiple ethnicities. However, these efforts resulted

in only a modest increase in participation from those communities. Nevertheless, during the analysis, care was taken to identify potential differences across ethnic groups, however, most of the differences observed were by migrant generation rather than by ethnicity.

As previously discussed in Section 1.3, ethnic minority communities are a heterogenous group, and their behaviours are shaped by an intersection of wide-ranging factors. This therefore means that study findings may not be generalisable and applicable to all ethnic minority communities. However, most of the recommendations for use of the PhD findings begin with community engagement allowing for the relevant communities to drive changes specific to their communities when using these recommendations. Also, most participants were recruited from existing community groups which may potentially explain the strong value of community within the thesis narrative. However, conversations during individual interviews with some participants who were not recruited from community groups reflected a desire among these people to be more involved in the community.

One possible weakness was that the scoping review conducted in Study 1 did not include social media, news, blogs and other audio-visual channels of messaging, which are widely accessed by the public. Any messaging through such media on physical activity and healthy eating will therefore have been missed. However, the objective of the review was not to comprehensively identify all messages that were available but to scope the kinds of messaging that was produced by relevant health authorities to inform the subsequent qualitative study (Study 2). The findings from the qualitative study aligned closely with the findings of the scoping review, revealing no substantially new categories of messaging, confirming that major substantive areas were not missed by the scoping review.

Another potential limitation of this thesis is that data collection for the studies underpinning the PhD was carried out between 2021 and 2022, which spanned across different phases of the COVID-19 pandemic. This may have impacted on participants' experiences depending on the point during the pandemic in which they were engaged in the research. For example, more messaging was expected to be available in 2022 compared to 2021 which could translate to greater access for participants interviewed in 2022. However, findings revealed no major differences in messaging accessed by participants based on when they were interviewed.

During some face-to-face focus group discussions, a co-moderator was present who was typically the community group leader or an active member of the group. Although existing literature suggests that the presence of group leaders in such discussion groups may influences the group dynamics, increase risk of social desirability bias and potentially inhibit open discussion (Bergen and Labonté, 2020; Fallon and Brown, 2002), the opposite was observed. The presence of the group leaders appeared to foster trust and enhance participation. They

contributed to the discussion, supported others' views and did not dominate the conversations. Participants were also comfortable to express their differing opinions and views, even when these contrasted with those of the lead. Findings should also be considered in the context of the qualitative methods used. While these methods were useful to gain in-depth insights into the lived experiences of participants, findings cannot be widely generalised. Similarly, due to the use of focus groups, participants may be influenced by the responses of others to fit in socially. Also, as a researcher with lived experience of being from an ethnic minority community, it is possible that the author's own biases are reflected in the way they engaged with communities during data collection and the lens through which the study findings were interpreted. For rigour, the author kept a reflexive journal throughout the project and provides some reflections about this in Appendix D.

Nonetheless, the studies provide a range of testable strategies which can be used to engage ethnic minority communities in improving their health behaviours and consequently their health.

4.6 Conclusion

Findings from this PhD have provided important insights into the way public health is delivered, especially to often underserved communities. For these findings to translate into real life application, public health policy level changes are required. Evidence based policy recommendations to address health inequalities in the UK and improve health have long existed (Marmot M, 2020; Marmot, 2013; Marmot, 2020; Black, 1982) yet, most of these recommendations are not actioned, resulting in persisting inequalities (Hiam et al., 2024).

The UK Labour government which took up office in July 2024 has made commitments to improving health with a focus on adopting a prevention focused approach and embedding health within communities. Little focus has, however, been given to the issue of health inequalities; there was no mention of inequalities in the budget announced in October 2024. Without targeted action, there is a risk that such commitments may fall short of addressing the structural and systemic drivers of poor health outcomes among these underserved communities.

Recently, there has been a notable shift within the UK health and public health sector towards a more explicit focus on addressing health inequalities. Initiatives such as the Health Determinants Research Collaborations (HDRCs), Integrated Care Boards and development of policies and strategies across the NHS, Department of Health and Social Care and research funding agencies (UKRI, NIHR) are all valuable steps. The Core20PLUS5 model developed by NHS England which identifies the most deprived population groups to ensure public health efforts and research are

tailored to meet the needs of these groups is also a good example. These initiatives aim to prioritise underserved communities and ensure national and local efforts are well tailored.

While these developments are promising, their success will depend on whether they embrace the strength of community-led knowledge. The key message from this PhD is that public health policies and actions be co-produced with communities and not just designed by those in power 'for' the community. To ensure relevance and impact, these efforts need to reflect the lived experiences, cultural contexts and specific needs of the intended communities and this can only be achieved when the community is actively involved across all stages of developing, implementing and delivering those public health interventions.

4.7 Personal reflections of the author

In this section, a critical reflection is provided on how my role as a researcher and my lived experiences during this PhD may have interacted with the way data were collected, analysed, interpreted and reported in this thesis.

During this PhD, I was employed by the University as a full-time senior research assistant, working specifically on the PAN-Co-POWeR project. This was my first substantial job following the completion of my master's degree in public health at the University and then a long job search involving writing 127 job applications and supporting statements. It was therefore with so much joy, passion and zeal that I began working on the PAN-Co-POWeR project. Also, because most of my public health related practice before working in the UK was carried out in Nigeria, a very communal setting, I was aware of the importance of working with communities to deliver public health. To me, it seemed it was not possible to work in public health without community engagement. All these thoughts and experiences shaped how I approached the project. Although the project grant had already been awarded, my first few actions on starting the project were to embed the project in community engagement to a greater degree than had been planned. I was highly motivated, and this motivation shone through in the way I approached communities and engaged with them.

Reciprocity is also an important aspect of community engagement (Gafari et al., 2024b), so based on this, I was also keen about how the project could give back to the community. I would often include some nutrition education discussions, have conversations on some of the issues participants or partners raised during discussions and offer to contribute to some community activities including singing with my choir and playing card games at their events. Initially, I wondered if I was being too involved and so introducing a high amount of bias to the studies. However, rooted in the philosophical stance and CBPR principles I adopted during this project, I

acknowledged that I had to ultimately work with communities to build trust. On evaluation and speaking with some of the people involved in this project, it was this work and my high level of engagement that helped build trust with the community and helped ensure the success of the project.

I am from a visible ethnic minority group and had only lived in the UK for two years before the project started. This influenced the way I collected data, moderated interviews and how I interpreted the data. For example, in discussions with first generation migrants, I understood slang and other culture specific non-verbal communications being used. In a particular focus group discussion, a participant was sharing about something they experienced during the pandemic and used a slang word, following this with 'you will not understand' but explained that they had used the word because they could not find a better way to express it in English. I immediately understood the word they used, laughed and replied using the same kind of slang. The participant was surprised that I understood and others in the group felt freer to speak in a way that was more comfortable for them. This opened up the conversation in a way that would not have been possible had I not shared their cultural background. They remarked that working on the project with me made them feel like they were 'helping our person'. They subsequently spoke to others in their community positively about the project and many more people were then interested in getting involved. There were, however, instances in conversations with British born communities where I was asked how long I had been in the UK and because it was such a short time, they thought I could not relate to the life-long experiences they have faced. In those instances, I wondered if I could have done something differently in those conversations to encourage them to explain further. During one of my peer debrief sessions with the work package lead on the project, they attested to the fact that experiences of UK life were different for someone like them who was born and lived here but was also from a visible ethnic minority background.

Similarly, my identity as a Black African may have influenced the recruitment process across the studies that make up this PhD. Although, I sought to engage participants from a wide range of ethnic minority backgrounds, most of those who took part in the study identified as Black African, like myself. I believe this shared identity may have facilitated a sense of familiarity and trust, like in the example I shared about the use of slang. In contrast, despite genuine efforts such as working with community engagement partners who were from Asian communities, participation from other ethnic minority groups, though present, remained limited.

Reflecting on my biggest lesson and what I would improve if I were to carry out this PhD again, I have realised the importance of theory in research. Most of my previous experience before working on the PAN-Co-POWeR project was as a public health practitioner and coming from that practice-oriented environment, I was primarily focused on 'doing', paying less attention to

theoretical frameworks underpinning some of those actions. Coupled with the fast-paced nature of the project, I had to do a lot of 'learning on the job'. Now, while writing up this thesis and engaging in more extensive reading, I have learnt and discovered so much more about research, CBPR and qualitative methodology than I knew while carrying out the studies which could have significantly improved the quality of the studies. For example, some knowledge of political theories explaining structural racism and the way that this determines health outcomes might have helped me understand the relationships between my observations. Also, I now know more about inductive thematic analysis than I knew when I analysed the data from the studies.

Finally, in my now five years of being in the UK, I have experienced discrimination and felt inhibited to engage in activities I valued. Many of these experiences were subconsciously rooted and hearing participants describe similar experiences during discussions made those discussions hit close to home. In some instances, I felt angry about why after so many years of activism against racism, people from ethnic minorities still experience overt discrimination such as they were describing, but more often, it helped me to be more empathetic towards participants making them feel safe to share.

Herein lies the beauty of qualitative research; that the researcher is ultimately interacting with the data and the data are shaped by those interactions. The methodological and philosophical stance I adopted meant that I was very much involved in the data, and my own experiences influenced the data generated and how they were interpreted. For many, this may make them consider whether I have biased the data, but, as explained in section 2.2, the findings from qualitative research are constructed by the researcher-research interaction. It cannot and should not be avoided and it is in fact, this interaction that contributes to the richness and robustness of the study.

Appendix A: Paper 1: Misaligned or misheard? Physical activity and healthy eating messaging to ethnic minority communities during the COVID-19 pandemic: A qualitative study and scoping review (Gafari et al., 2024a)

The full text version of this paper is available open access online via this link: https://journals.plos.org/globalpublichealth/article?id=10.1371/journal.pgph.0003345

For ease, the paper can also be accessed by scanning the QR code below.

Appendix B: Paper 2: Including the values of UK ethnic minority communities in policies to improve physical activity and healthy eating (Gafari et al., 2024c)

The full text version of this paper is available open access online via this link: https://link.springer.com/article/10.1186/s12982-024-00163-4#

For ease, the paper can also be accessed by scanning the QR code below.

Appendix C: Paper 3: Building trust and increasing inclusion in public health research: co-produced strategies for engaging UK ethnic minority communities in research

The full text version of this paper is available open access online via this link: https://www.sciencedirect.com/science/article/pii/S003335062400194X?via%3Dihub

For ease, the paper can also be accessed by scanning the QR code below.

Appendix D: Addendum to Study 3 Methods: Reflections on Values and Culture

People's behaviours as well as the ways in which they will respond to public health interventions particularly those focused on individual behaviour change, is dependent on their values (Kelly and Barker, 2016). Understanding the values that drive the behaviours of ethnic minority communities is therefore important to ensure public health interventions are relevant and fit within the communities' priorities.

Study 3 of this PhD was carried out to identify the main values underlying physical activity and healthy eating behaviours among UK ethnic minority communities (Gafari et al., 2024c). To achieve this, an inductive thematic analysis was conducted to analyse the qualitative data collected (Braun and Clarke, 2006). The analysis went beyond surface descriptions, focusing on the latent and implicit meanings within the data in line with the interpretivist paradigm and relativist epistemological underpinning of the study (Braun and Clarke, 2006). The data were interpreted to understand the underlying values informing people's actions. For example, references to shared family meals were understood not only as something participants did from time to time but also as an expression of family values. This allowed the researcher to capture what was explicitly said and what was implied based on the researcher's interpretation. The researcher's positionality as a young woman of ethnic minority background also contributed to the interpretative process as she in some instances was familiar with some of the narratives, knew when to ask probing questions during the discussions and was able to discern implicit meanings during the analysis.

Throughout the analysis process, the research team engaged in reflexive dialogue and iterative discussion, refining themes collaboratively. To further validate the interpretation of the data, results from the analysis were shared with study participants to get their feedback and they confirmed that results reflected their experiences and narratives.

The challenges associated with defining values and culture were acknowledged during the analysis process. Both culture and values are complex, dynamic and context dependent concepts that cannot be easily conceptualised (Kashima, 2014; Worsley and Lea, 2008). Agreeing on a fixed set of definitions for these two concepts is therefore difficult (Raeff et al., 2020) and the boundaries between these two concepts are fluid. For example, in Study 3 and the overall PhD, culture was defined as "transmissible non-genetic guidelines available and accessible to a group of people as the right way to live" (Kashima, 2014), while values were defined as "guiding principles in people's lives" (Worsley and Lea, 2008). Based on these definitions, both concepts

seem so intertwined. Culture often reflects underlying values, and values are sometimes shaped by cultural context. For example, it may either be cultural for people to value community or community like culture may be one of peoples' values. This raised important questions during analysis: were participants' behaviours driven by culture, or did they value culture itself alongside other things?

While reaching the clear-cut boundary between both concepts was beyond the scope of this PhD, the study adopted recommendations from the literature that culture and values are not taken as tangible or measurable variables. Instead, they were understood as a dynamic and shared system of meaning interpreted in the way people speak about and refer to it (Raeff et al., 2020; Causadias, 2020; DiBianca Fasoli, 2020). Rather than imposing strict and rigid definitions, the analysis stayed close to participant's expressions of what mattered to them. By focusing on what participants valued and how they articulated those values, the study provided a more nuanced understanding of behavioural motivations.

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