

A co-produced sustainable food-based intervention to improve nutritional health and ageing in older South Asian and Black African and Caribbean communities living in the UK

Study name: Tangerine – nuTritional heAlth aNd aGeing in oldER ethnIc miNoritiEs

Introduction

The older population in the UK is growing and becoming more ethnically diverse, with the largest increase since the last census in Asians and Black African and Caribbean ethnic minority groups.¹ In England and Wales, the number of older ethnic minority adults is projected to reach 7.4 million for those aged 50 years and over, and 3.8 million for those aged 65 and over by 2051.² Ethnic minority groups in the UK experience disproportionate health inequalities, and often live in areas of higher deprivation and disadvantaged socioeconomic position compared with the White British population, predisposing them to poorer health and quality of life in older age.³ In spite of policy implementations to try to address health inequalities, there remains a lack of equitable and relevant health and social policies to support this rapidly growing proportion of the population to age more healthily.⁴ Increasing the amount of time spent in good health by these growing sub-groups of the population is an important priority, one which will also reduce demand on health and care services as well as family carers and ultimately provide economic benefit.

Key processes of ageing begin in midlife and determine health in later life.^{5, 6} There is compelling evidence that nutrition at midlife is a key determinant of healthy ageing and a major modifiable factor to modulate the ageing process.⁷ A healthy diet is essential for the prevention of all major chronic non-communicable diseases in midlife and beyond, both directly through the effect of individual macro (notably protein intake) and micronutrients, and indirectly through the control of body weight.⁸ Yet, more research is necessary to understand what is needed to eat better and to extend life years lived well. Dietary patterns such as adherence to the Mediterranean diet have been promoted as the diet of choice when promoting healthy diet to reduce the risk of cardiovascular disease,⁹ cognition decline,¹⁰ and dementia risk.¹¹ However, many older people of ethnically diverse communities, particularly of South Asian, African and Caribbean origin, prefer to maintain their traditional diet due to familiarity of the foods and the deep cultural significance and social role of food in maintaining social relationships and traditions, and therefore would not identify with the Mediterranean diet.¹²⁻¹⁵

Literature review

There are numerous age-related physiological, psychological and social changes that occur as people age, resulting in poor nutritional status and risk of malnutrition. Research shows there is high prevalence of early-onset obesity and other long-term conditions including type 2 diabetes, cardiovascular disease, and more recently COVID-19 in individuals from ethnic minority groups, with severe negative impacts on quality of life and health in older age.^{3, 16} For example, after accounting for age, hypertension was highest among Black Caribbean, Black African, and Pakistani adults, and

women from Black Caribbean (74%), Pakistani (74%), and Black African (73%) backgrounds were most likely to be overweight or obese.¹⁷ In a systematic review of the non-communicable disease burden among groups in high income countries including the UK, diabetes was shown to be consistently higher in all migrant groups compared to the host populations.¹⁸

While recognising these health disparities, factors that have been attributed to poor dietary health of older adults from ethnic minority groups include financial constraints, language barriers, age, availability of traditional foods, and years spent in the host country.¹⁹ Qualitative research has shown that personal, social and cultural/environmental factors influence eating behaviours and physical function in older adults, differing by age, ethnicity, and gender.⁹ It is often assumed that ethnic minorities live in multigenerational households that offer continuous support for older members. However, growing evidence suggests that this is not the case, and that they do not have extensive social networks and are at increased risk of loneliness.²⁰ These factors have been amplified by the impacts of COVID-19 and the sudden cost-of-living increases, making older people even more vulnerable to food insecurity and risk of poor nutrition through impact at household level. Age UK estimate that 2 million older adult households do not have sufficient funding to cover essential spending, with 26% of those surveyed spending less on food shopping than previously.²¹ Those from ethnic minority backgrounds are more likely to experience fuel poverty, and in particular those from Black African communities are affected across multiple axes of vulnerability,²² which may compound people's ability to prepare and cook hot food. A recently published Food Standards Agency report showed that food insecurity was more prevalent among South Asian, Black African and Black Caribbean individuals compared to White British groups of the population, including among older people.²³

To enable older adults from ethnic minority groups to age well, there is a strategic imperative to understand how they can adopt healthy diets to meet their needs alongside active lifestyle. However, there is limited published data exploring factors influencing healthy behaviours,^{13, 20} and a dearth of well-designed nutrition-related interventions specifically targeting ethnic communities, delivered at an early stage before metabolic processes and pathological cascades become irreversible.⁷ This underlies the need for new research, taking into account the cultural, social and economic contexts to better understand this complex nutritional landscape and inform the development of key policies to improve nutritional health with positive impacts on healthy ageing. For example, research indicated that intervention strategies should be tailored to ethnocultural identity and focus on maintaining healthy traditional staples as part of a healthy diet with reduction of unhealthy accessory foods such as sugar-sweetened beverages, because these foods would be less important to identity and culture.^{14, 24}

Scientific and policy potential

As a first step towards meeting this research need, we secured UK Research and Innovation (UKRI) pump prime funding from the Food4Years Ageing Network²⁵ to investigate inequalities in nutrition and healthy ageing for older Black African and Caribbean older adults in the UK. This proposed study will build on and extend this research. It will draw on our established networks and ongoing community engagement activities aimed at promoting healthier diets among ethnic minority groups

in Greater Manchester and Southwest England which have shown a need for interventions to improve nutrition of older adults within this population. To do this, we have received funding from the Medical Research Council and have formed an interdisciplinary team of researchers from diverse ethnic communities with experience of research in different communities and in using approaches for those who are often hard to reach to engage in research.

Through co-production, we will obtain knowledge that can be rapidly translated into practical strategies to achieve impact. This responds directly to one of UKRI's priorities to understand how nutritious, healthy foods and whole diets optimise health between different population groups. It will contribute to initiatives that ensure improved health and quality of life for individuals from ethnic minority communities and to national and global initiatives to improve nutrition and quality of life in older age, including the UK National Food Strategy, UK Government's Levelling Up Agenda, and the World Health Organization Global Strategy on Ageing and Health.

Research aims and objectives

The aim of the Tangerine study is to co-produce a novel food-based intervention to improve nutrition and healthy ageing in UK South Asian and Black African and Caribbean older adults.

The proposed research project has been developed to achieve the following objectives,

The objectives of the study (taken from the UKRI proposal) are:

1. To investigate the key determinants (e.g. socio-economic, environmental, psychosocial, and physical) of nutrition, dietary behaviour, and food insecurity during midlife and how these vary between ethnic groups through secondary analysis of key UK national datasets.
2. To determine the essential and desirable features of features of a food-based intervention from the perspectives of older adults, community and faith groups and key stakeholders.
3. To identify the mechanisms and opportunities to ensure sustained improvements in nutritional health and co-produce a toolkit with recommendations and health messages to support culturally tailored food-based and inclusive approaches for optimising engagement.

The objectives of the study will be addressed over 24 months in two regions in England (North – Greater Manchester; South – Wessex) to provide different perspectives. We will be using a co-produced approach, working with community partners and drawing on their strengths using participatory research, to explore diverse experiences in ageing and to co-produce inclusive outputs with older people.²⁶ The project comprises three work packages:

1. Work Package 1 will address all three research objectives (1-3).
2. Work Package 2 will involve the data collection and analysis and has two arms.
 - a. Quantitative secondary data analysis (Research Objective 1)
 - b. Qualitative data collection and analysis (Research Objective 2)
3. Work Package 3 will mobilise research knowledge for impact (Research Objective 3).

Work package 1: Co-production and Public Involvement/Engagement

This work package addresses all three research objectives (1-3). Co-production of research refers to research undertaken by researchers together with people who have a direct interest in, or experience of, the issue being researched. It is an active process whereby people from different positions of power, status, ability, wealth and confidence work together with principles of equality and democracy.²⁷ Concepts of co-production and public involvement and engagement (PIE) located within communities are embedded within the proposed research to ensure findings are inclusive, involving and valuing the voices and experiences of participants on an equal footing with stakeholders (e.g. community/faith leaders, gate keepers, charities, providers of health and care services).

The research team have vast experience of working with ethnically diverse communities and will draw on these networks, establishing trust and rapport with community leaders through their research by attending faith-based services and events. To meaningfully deliver a co-produced project, we will work with community members and leads from the following project partners: Caribbean & African Health Network (CAHN), Black Beetle Health (BBH), Bournemouth Poole Christchurch Indian Community (BPC); Strengthening Faith Institutions (SFI), and Social Enterprise Upturn to help co-design the intervention through roundtable discussions and establishing groups with members at each of the study sites to develop recommendations and themes to inform policy. These partners were involved in the project development stage for funding and have already contributed to the design aspect through feedback to the research team members.

Involvement from project partners will include three roles:

1. One community main contact from each group will be a member of the Project Advisory Group, working with the research team to oversee study progress.

Community group main contacts will meet individually with members of the research team regularly (monthly or bi-monthly as required), either in person or virtually, to ensure that study milestones are met, review risk, and mitigate any problems that may arise.

2. Community main contacts will identify 2-3 individuals (could include the community leaders themselves) with lived experience (could include being aged 60 and over, working/living with older adults) from each group to form a Public Involvement/Engagement group.

The PIE group will meet a minimum of three times over the course of the study, either with or without research team members. The first meeting will consist of reviewing research materials (research design, ethics, participant information leaflets, consent forms etc). The second meeting will sense check data collected, and the third meeting will be a round-table discussion (in-person or online as preferred) to focus on dissemination and policy recommendations.

3. The PIE group will identify and assist with recruitment of between 8-20 members with representation from each community group to participate in our qualitative research arm (Work Package 2). Either a member of the PIE group or someone they identify from their community will facilitate the data collection for Work Package 2. The data collection process

will take place separately for each community as participants will be more comfortable and open with a facilitator from their own community, and due to the difficulty of bringing groups together to meet at one time.

Stakeholder engagement: The project is primarily focused on obtaining knowledge that can be quickly translated into practical strategies at several levels. As such, to engage the community and raise awareness as a whole, we will convene a stakeholder engagement group, including key community leaders, and representatives from our academic and professional networks (including professional organisations such as Pakistani Professionals, AGE UK, British Dietetic Association, Diverse Nutrition Association, British Nutrition Foundation, Nutrition Society Special Interest Group – Diet and Health of Minority Ethnic Groups, Malnutrition Awareness and Prevention Network). The stakeholder engagement group will convene later in the study to support dissemination and development of summary advice and policy briefings that highlight the key results of our research and contain infographic summaries.

Co-production will be embedded in all phases of the project from design to dissemination, as shown in Figure 1 below.

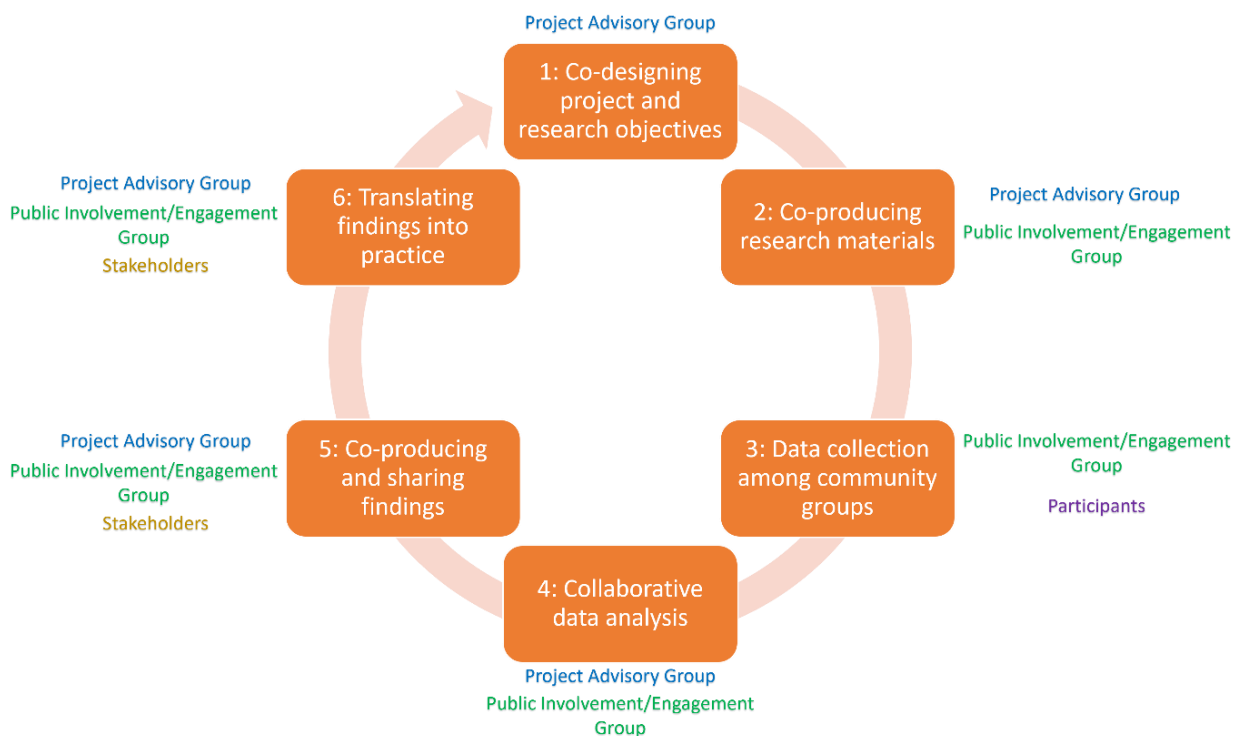


Figure 1: Integration of co-production principles and community involvement at different phases of the project. This figure has been adapted from Buffel's (2018) paper describing co-production with older people.²⁸

Work Package 2a: Quantitative secondary data analysis

We will conduct a quantitative secondary data analysis of UK Biobank,²⁹ with additional replication of data in 'Understanding Society – the UK Household Longitudinal Study (UKHLS),³⁰ to investigate diet quality and factors which influence the diet of South Asian and Black African and Caribbean adults from midlife onwards. We will focus on identifying characteristics to consider in the design of the intervention. We will then use multivariable regression to estimate the total effects of potential risk factors on diet quality score, as our primary outcome, within each group and assess whether associations differ between these groups and compared with individuals who identify as White British. Separate Directed Acyclic Graphs (DAGs) will be specified prior to each analysis and used to identify variables to include in the models. We will replicate this analysis in the Understanding Society dataset, and consider factors related to food insecurity using questions asked during the COVID-19 pandemic. Finally, as information on diet is self-reported, we will carry out similar analyses with Body Mass Index (BMI) and waist circumference as secondary outcomes, to assess whether associations are the same as those seen for the diet quality score.

Work Package 2b: Qualitative research study

Study design

To inform the development of the food-based intervention, we will use a qualitative visual ethnographic approach using group discussions, interviews, and photography³¹⁻³⁴ to determine the components of the food-based intervention (e.g. specific cultural foods, dietary restrictions etc.), to promote healthier diets and active lives, identifying community assets, and overcoming barriers to optimise engagement. This study is underpinned by Appreciative Action Research (AAR), a type of participatory action research that employs the strength-based approach embedded within Appreciative Inquiry (AI)^{31, 35} and is built upon social justice and empowerment³¹, rather than a traditional problem- or deficit-based approach.³⁶

We will use photovoice, a visual methodology with an overarching AAR approach which has been used across different age groups and populations, including ethnic groups,³⁷ to help researchers capture lived experiences and perceptions of older people in their communities.³⁸

Using photovoice will enable research participants to be co-researchers in the process and be in control of the representations of their research. The goals of photovoice in this study are:

1. To empower participants to record and reveal the strengths and challenges that exist within their own communities regarding healthy ageing and nutrition.
2. To engage participants in critical conversations about the intersecting issues that are important to them regarding healthy ageing.
3. To influence policy and practice across various levels through the sharing of participants' photographs and narratives.

Study setting and community selection

The study will be located in two different areas of England to include diverse perspectives. The regions selected face significant health and care challenges. Five communities will be selected from the two areas – representing the sociodemographic diversity in these areas. The region of Bournemouth, Christchurch and Poole is in south England, and has a population of just over 400,000 (Census 2021), of whom 1.2% identify as Asian Indian. The region of Manchester is in north England, and has a population of 551,938, of whom 11.9% identify as Asian Pakistani, 8.7% identify as Black African, 1.9% identify as Black Caribbean, and 1.8% identify as Asian Bangladeshi.

We chose to include these communities in these locations to reflect the diversity of the populations in these geographical locations and the existing links between members of the research team and community groups. The project partners have been chosen because of their strong links and engagement with community groups. They are the key link between the research team and the community and will be instrumental in building trust and relationships between the researchers and community members.

Participants

The target population will be individuals from UK South Asian and Black African and Caribbean communities, aged 60 years or above. This age range was chosen based on the categorisation used by the World Health Organisation³⁹ and United Nations⁴⁰, who identify older persons as those aged 60 years and above, and to ensure the study would be comparable to other research on healthy ageing.⁴¹ Participants for the qualitative study will be recruited by the community project partner PIE groups, supported by the research team's previous and current experience of working with underserved communities and wider networks in the different localities.^{42, 43} Purposive sampling and snowballing will be used to recruit participants for the research. Training for the project partners in relation to conducting the research will be undertaken (see below).

No specific exclusion criteria will be applied and individuals who have capacity to consent to participate in research will be supported to do so. The ability of a potential participant making an informed decision regarding their willingness to participate will be enhanced by providing an information sheet that is accessible and easy to read and presenting information aurally or in another language if preferred. Once it is confirmed that the potential participant has understood the research, retained the information, weighed the risks and benefits, and communicated their decision, their capacity to consent will be confirmed and their decision to agree or refuse to participate in the study will be accepted. At this meeting, participants will also answer a short questionnaire to collect their sociodemographic information.

Up to 50 participants will be recruited in total across the partner groups. The selection process will aim for variation in gender, age, and household type/composition. The study will be advertised using posters made by each of the community partners and placed in locations frequented by community members. Those interested in participating will be provided with a one-page participant information sheet and an infographic depicting their study flow, accompanied by a more detailed information sheet. The content of the information sheet will be verbally explained to potential participants by a

member of the PIE group in their preferred language to ensure understanding. If in agreement, they will sign a written informed consent form and answer basic sociodemographic questions. Participants will be reimbursed for their time in accordance with the NIHR Centre for Engagement and Dissemination payment guidance⁴⁴, and their right to withdraw at any time will be explained in documentation and verbally.

Research team and data collection

Prior to the start of the qualitative study, quantitative data analysis will be conducted to address the first objective of the Tangerine study (To investigate the key determinants of nutrition, dietary behaviour, and food insecurity during midlife and how these vary between ethnic groups through secondary analysis of key UK national dataset). Using the results from the quantitative study as well as initial discussion within the project advisory group, a brief manual (a set of concepts or questions)⁴⁵ comprising themes of benefits and barriers of their food practices will be produced. This will guide the participants through the photovoice aspect of the study.

Training for project partners

An initial meeting with members of the PAG and PIE groups will be held to introduce the study team to the PIE group. The PIE group members will review and comment on the language and suitability of the research materials (ethics, participant information sheet, consent form, photovoice manual etc). In this meeting we will also cover the steps involved in conducting research, including the timeline, recruitment of a diverse range of participants, explaining the study to participants using the patient information leaflet and ensuring comprehension, and taking informed consent.

The data collection process will include two focus group sessions with approximately five participants each (lasting approximately 1-2 hours), and one semi-structured interview (1 hour). The focus groups will be held at the beginning and end of data collection and will include the participants and be facilitated by a community researcher (a member of, or someone appointed by, the PIE group). One or two research team members will also be present to provide support, if necessary, but will take on a more 'backseat' role. The interview will occur with participants (either individually or in pairs) prior to the second focus group and will be guided by a member of the PIE group and/or a researcher. All meetings will be either in-person or virtually depending on preference and will be audio recorded with permission, and later translated into English as needed and transcribed. Any field notes collected during these meetings will be shared with the participants. Figure 2 provides an outline of the role of the PIE group members.

1.	Introductory meeting with research team member and community main contact.
2.	Review study documentation and need for translation.
3.	Meet with research team member to discuss research process and recruitment.
4.	Conduct recruitment of participants.
5.	Second meeting with research team member to discuss data collection: - Focus group discussions and one-to-one interviews.
6.	Organise focus group 1.
7.	Co-facilitate focus group 1 with study team member.
8.	Organise and conduct participant one-to-one interviews.
9.	Organise focus group 2.
10.	Co-facilitate focus group 2 with study team member.
11.	Discuss data collected with study team member.
12.	Final organised meeting – round-table discussion to focus on findings and steps forward.

Figure 2: PIE group task flowchart through Work Package 1 and 2b.

The first focus group will be an introductory session to introduce the project, photovoice, and ethical aspects. Participants will be provided with digital cameras and information on how to use them. After each participant is comfortable with using the camera, they will be asked to take at least one photograph per statement to show their perspective of nutrition and diet. They will also be asked to either write or audio/video record a short description interpreting each photo.

Participants will be asked to take photographs over a period of one to two weeks. Once a participant has taken the photos and recorded their explanations of each photo, they will participate in a semi-structured interview to select and discuss between 3 and 6 photographs each that are most meaningful to them and elaborate on what each picture means. By sharing and talking about their photographs, participants will be able to use the power of visual imagery to communicate their life experiences, knowledge, and expertise. During the interview, participants will be encouraged to frame their findings using the SHOWeD³⁴ technique: What do you **See** here? What's really **H**appening here? How does this relate to **O**ur lives? **W**hy does this problem/strength exist? What can we **D**o about this? Critical discussion in this manner will enable us to collaboratively develop strategies for

changing the situation. After exploring and discussing the photographs, we will ask participants if there were any photos that they wanted to take but did not have the opportunity to do so, to generate discussion on aspects they were not able to photograph. Participants will also be asked about their experience of photovoice.

The second focus groups will take place for each of the community groups, during which participants will select the photographs that most accurately reflect their nutrition and diet, contextualise the photographs by telling stories of the meaning of each one, and codifying them – identifying issues, themes or theories that emerge. They will be facilitated to identify through the images factors that drive food choices, the food environment, and cultural practices, in addition to barriers and facilitators they experience in accessing and preparing food in their communities. Figure 3 shows a timeline of the involvement required from the participants.

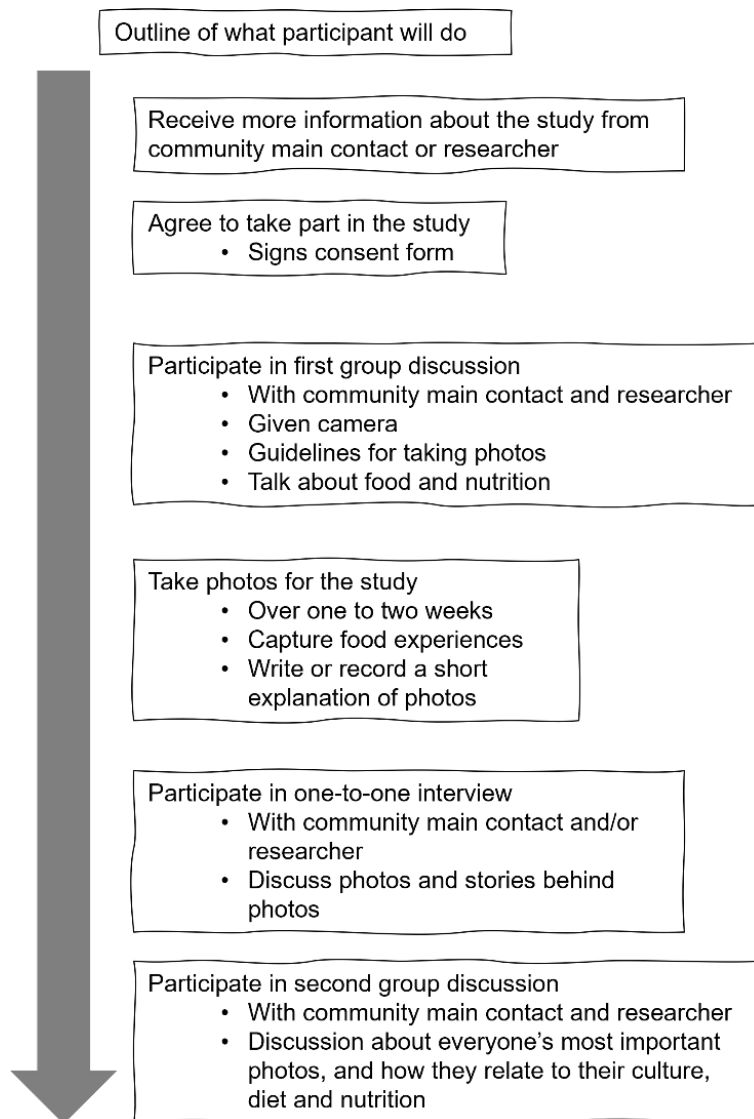


Figure 3: Participant flow through Work Package 2b.

After the interviews and focus groups, a member of the research team will write a summary for each photo selected during the second focus group based on the participant's original descriptions. The photographs and summaries will be shared with the participants who took the photos to ensure that the narrative reflects their intentions. After this review and editing, the final summary will be printed and displayed next to its photo. A photo exhibition illustrating diet and nutrition in older people of ethnic minority origin will be created. The participants, members of their communities, stakeholders, researchers, and any other interested parties will be invited to the exhibition, which will provide a forum to disseminate the study findings and encourage critical dialogue among attendees. The exhibition and stakeholder events will take place in both geographical study locations to ensure that all community groups and stakeholders can engage with each other, and knowledge generated can be disseminated into action points that are relevant to each community.

Data analysis

A multi-disciplinary and multi-cultural sub-team of researchers will be formed to analyse the data. Qualitative data from the photovoice technique, interviews, focus groups, and field notes will be coded, organised, and analysed using NVivo Pro 12.5 (QSR International, 2020), which permits the coding of photos as well as text. Using an intersectional lens, deductive and inductive approaches will be used for thematic and content analysis and to interpret themes and patterns within the data.^{46, 47} The contents of the photographs will be coded together with the interviews discussing them, as the photographs are the means to bring forward the participants' stories.⁴⁸

The qualitative research team will examine and code the interviews line-by-line individually using an inductive approach. Research team members will initially independently code a couple of transcripts each to develop preliminary codes. Then, a working group meeting will be held to discuss findings and identify themes and create a preliminary coding frame to analyse the data. The team will then code another couple of transcripts each and meet again to revise the coding frame. After a few rounds of this process and once consensus has been established regarding codes to include and their definitions, the codebook will be finalised. Team members will then independently code the remaining transcripts. A section of the data will be cross coded to ensure consistent and reliable data coding, with discrepancies being identified and resolved through team discussion. Researchers will identify all themes related to the research questions.

Work Package 3: Mobilising research knowledge for impact

This work package will mobilise new knowledge generated from WP1 and WP2 to co-produce a plan to maximise impact through outputs developed with and targeted at diverse ethnic communities. We will mobilise new knowledge following MRC framework.⁴⁹ We have a strong track record for co-produced outputs with participants to promote inclusive ageing (*e.g.* <https://ncpqsw.com/research/supporting-agencies-and-practitioners-to-meet-the-needs-of-older-lgbt-people/>; <https://www.bournemouth.ac.uk/research/projects/optimising-food-nutritional-care-people-dementia>).

A knowledge mobilisation and impact strategy will be co-produced from the start of the study with the PIE and stakeholder groups, further refined/updated during the study (WP1). We will use the

empirical quantitative and qualitative data collected in WP2 to identify the essential and desirable features of a food-based intervention to support improved food and nutritional health. We will do this by triangulating data using adapted triangulation protocol technique.⁵⁰ In principle, a triangulation meeting of research team will take place to discuss the datasets and reach consensus with key representatives from the PIE group (WP1) and recorded in a coding table/matrix. We will also draw upon our stakeholder group with professionals and academics to provide advice and guidance. This will inform the co-production of an adaptable toolkit with recommendations that will be a benchmark for services, policies and practices and guidance/resources providing a culturally tailored inclusive food-based approach to maximise impact and benefit through outputs, appropriately targeted at relevant ethnic minority groups and policy makers.

Ethics

Bournemouth University will act as Research Sponsor for the research. Study records will be reviewed as required for monitoring and audit by the Sponsor in accordance with the UK Policy Framework for Health & Social Care Research to ensure quality integrity of the research. Ethics approval will be sought from the Bournemouth University Research Ethics Committee. All study ethics documentation will be discussed with the PIE group before submission.

We use a rights-based approach to underpin how we work with participants, ensuring respects for individuals and giving people the right to take part and withdraw from the study. We will ensure that study documentation is accessible using appropriate lay language (reviewed by PIE group) and time spent by researchers and the PIE group ensuring participants understand the study and what participation entails. Family and friends will be involved in the decision making as appropriate to support translation if needed (translators will be used where necessary; members of the PIE group/research team will enable translation where possible). The study will not involve people without capacity to consent, for example due to advanced dementia or people with severe mental illness. All participants and PIE group members will be compensated for their time in line with the National Institute of Health and Care Research Public Contributor Payment Policy.⁴⁴

All participants will be provided with written information and will sign a written consent form to take part in the study at the start of the initial meeting. Participants will be asked to inform any individual appearing in any photographs on the purposes of the study and that the photographs will be used as part of an exhibition and publications, and to request any individuals appearing in the photographs for their consent and to sign acknowledgement and release forms.

Personal contact details will be stored in encrypted database, only accessible by the research team. Publication of any photos or direct quotes will be fully anonymised. Participant focus groups and interviews will be recorded and stored securely, then transcribed verbatim and anonymised for use in analysis. In-person discussions will be audio recorded to auto-transcribe the files and researchers will upload these to secure BU servers before deleting the files from recording devices (phones, laptops) and checking over transcriptions. Any online interviews will be audio and video recorded through MS Teams and auto transcribed.

The research team have considerable experience of undertaking research with members of the public including older people and from those living in diverse ethnic communities and using strategies for those hard to reach to engage them in research. The study also involves using visual

methods and anonymity and confidentiality will be ensured. Participants who wish to participate in interviews, but not take photos will be given opportunity to do so.

Written consent to use the visual images either from photo or project video will be confirmed. All visual data will be reviewed with each participant at the end of data collection and specific consent required for particular use e.g. conference presentation or for website will be taken. This is an important aspect to consider as, being the owners of the photographs, participants have the right to have their voices heard through the representation of photographs and accompanying summaries as they feel appropriate. We will inform participants of the study findings after completing a draft study report. They will be given opportunity to receive final copy report as well as short lay summary (co-produced with the PIE group). Researchers will adhere to lone worker policy of the PI's centre during research undertaken in the field.

Distress protocol

Discussions about food in the context of culture can elicit strong positive and negative feelings and emotions.⁵¹ For some individuals, participating in the study could be a potentially disturbing experience. To protect participant wellbeing in this study we have adapted a stepwise Qualitative Research Distress pProtocol⁵² to safely assess and respond to participant distress (Figure 4).

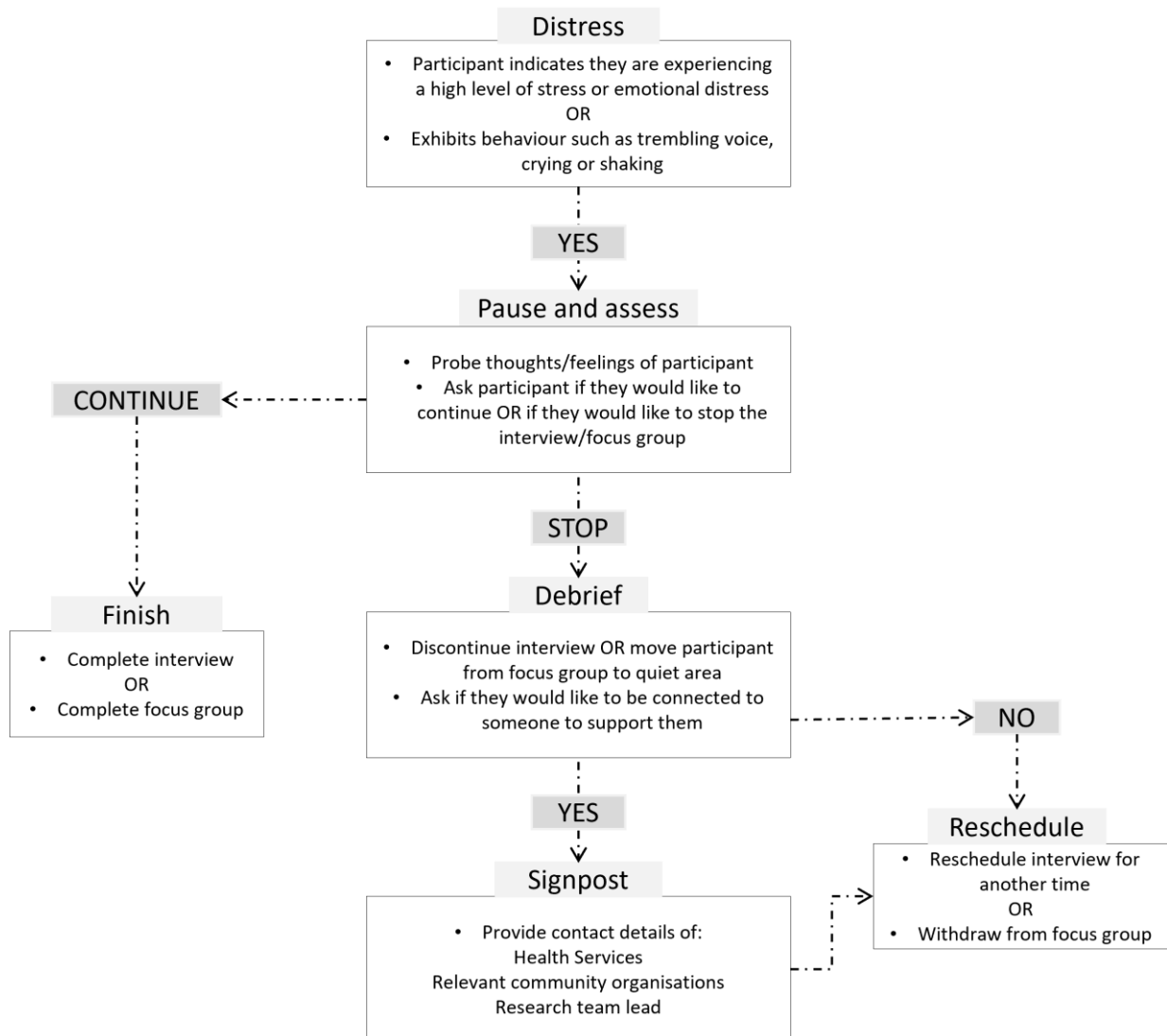


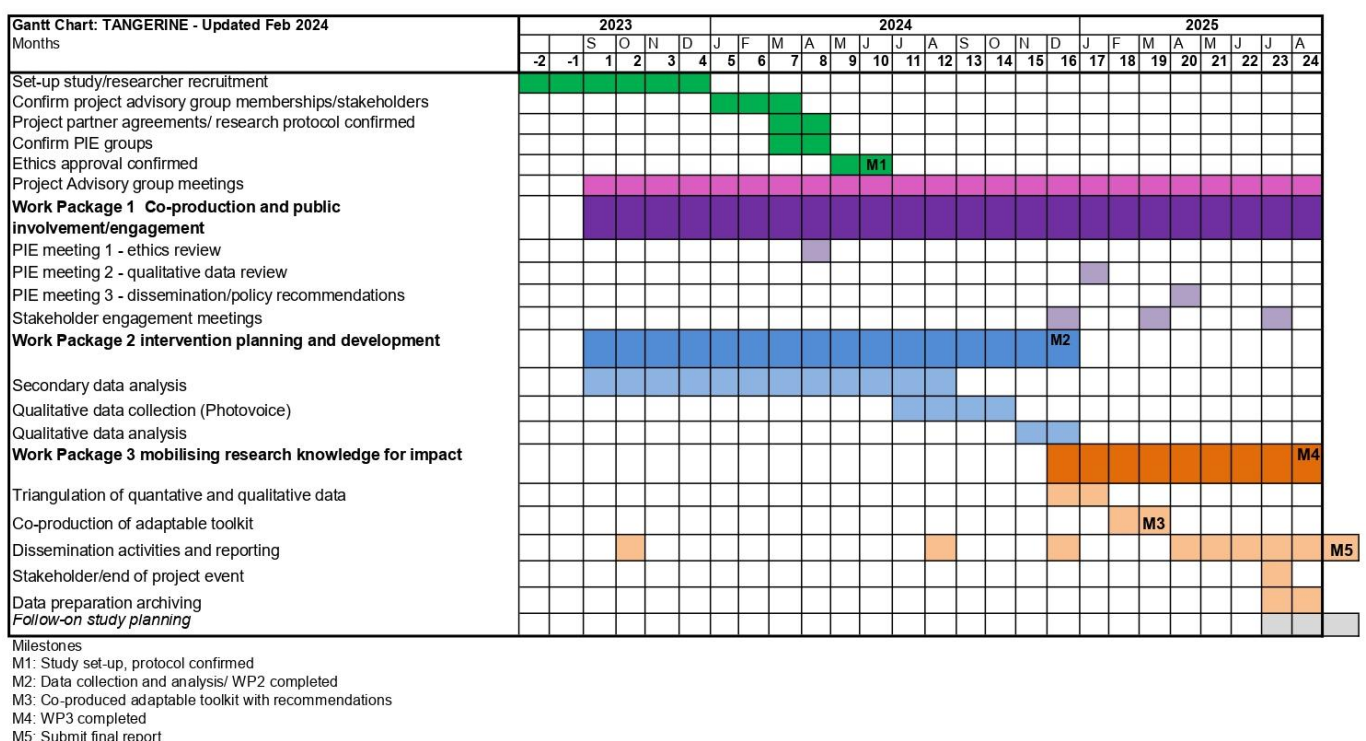
Figure 4: Participant distress protocol for interviews and focus groups.

End of study plan

At the end of the second focus group, we will notify participants of the conclusion of the data collection phase. They will be given the opportunity to provide feedback on their experience. We will explain again how and why we will be showcasing their photographs at an exhibition if they are willing, and how their data will be used to develop a toolkit to improve nutrition and healthy ageing among older adults of ethnic minority origins in the UK. To provide closure from the study, we will offer the participants and members of the PIE groups contact information for a designated member of the project partner of the community each participant belongs to. We will also provide them with a list of resources that are relevant to each community and study location, including local community organisations, helplines, or support groups, as well as links to culturally appropriate nutrition and diet messages.

The proposed study will provide robust data, new information, and recommendations on food-based solutions to improve nutritional health in ageing. It will provide new strategies about how we can engage equitably with underserved and underrepresented communities to implement inclusive and culturally tailored research to develop healthy, affordable foods and diets for all older adults. The key beneficiaries of the outputs and how impact will be achieved to exploit the research are the public, academics, professionals, and policymakers. We will co-produce a comprehensive report at the end of the research, detailing all the findings, drawing relevant conclusions and providing recommendations for future research. Plain English summaries, and translations as required, will be co-produced and widely disseminated to our participants and the general public.

Project timeline



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