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The Feasibility and Design of a Culturally Appropriate Health Promotion App for Black People in England: A Mixed-Methods Approach.

By

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"In The Name of Allah, The Beneficent, The Merciful" Quran (1:1)

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"Indeed, Allah is with the patient." Quran 2:153

ABSTRACT

The Feasibility and Design of a Culturally Appropriate Health Promotion App for Black People in England: A Mixed-Method Approach

Background: Black people in England experience significant health inequalities, including disproportionate higher prevalence of hypertension, type 2 diabetes mellitus, and maternal mortality. Smartphone health apps offer potential to address these inequalities, but limited research has explored their feasibility in this population. This study aimed to: (1) assess the feasibility of a culturally appropriate health promotion app for Black people in England focusing on its demand, acceptance, and implementation. (2) explore a design framework to guide understanding and development of a culturally appropriate app for Black people in England.

Methods: An explanatory sequential mixed-methods study design, combining quantitative cross-sectional survey data with qualitative focus group discussions, was employed. The quantitative component assessed the feasibility of the proposed app looking at previous health app adoption patterns, technology trust, preference of culturally appropriate app over contemporary ones, and self-reported perceived health status in relation to health app adoption. The qualitative component was designed integrating the Health Belief Model's constructs and explored perceptions on culturally appropriate health promotion apps: perceived benefits, motivation for use, anticipated barriers, and perception on access to information on illness susceptibility and severity and it perceived impact. Data was analysed statistically with SPSS for the quantitative part, and framework analysis for the qualitative aspect.

Key Findings: The findings revealed moderate previous health app adoption (54.8% prior use), but high discontinuation rates (70.9%), mainly due to loss of interest. Only 40.3% of respondents had been recommended a health app by a healthcare provider. Prior health app experience significantly predicted preference of a culturally appropriate health promotion app (χ 2 = 33.9, p < .001). Female respondents were significantly more likely to download and use health apps (χ 2 = 9.3, p < .002), whilst age showed no significant relationship with adoption. Notably, perceived wellness was not associated with app download and use, suggesting that subjective health status does not drive adoption. Black African respondents reported substantially better self-reported health (67%) compared to Black Caribbean respondents (31%), indicating the Black community in England is not monolithic and may require ethnically tailored approaches. Three key perceived benefits of a culturally appropriate health promotion app were revealed: addressing health needs specific to Black people, providing access to healthcare information, and fostering trustworthiness. Participants articulated several motivations that would encourage them to continue using an app. The App should: fulfilling user expectations, providing informative and current content, and incorporating gamification features. However, significant barriers emerged, particularly concerns about data security, confidentiality, and information credibility. Participants expressed concerns about illness susceptibility and severity, especially regarding an App's ability to provide accurate diagnoses and quality mental health information. A critical trust paradox revealed that trust is essential to app adoption yet building trust requires demonstration of trustworthiness through use.

Conclusion: A culturally appropriate health promotion app is a feasible means of providing health education for Black people in England. However, success requires genuine community empowerment and sustained participation in the design, development, and implementation processes.

Keyword: *Health inequalities, culturally appropriate interventions, health promotion, User-centred design, participatory approach, Black community empowerment. Health Belief Model*

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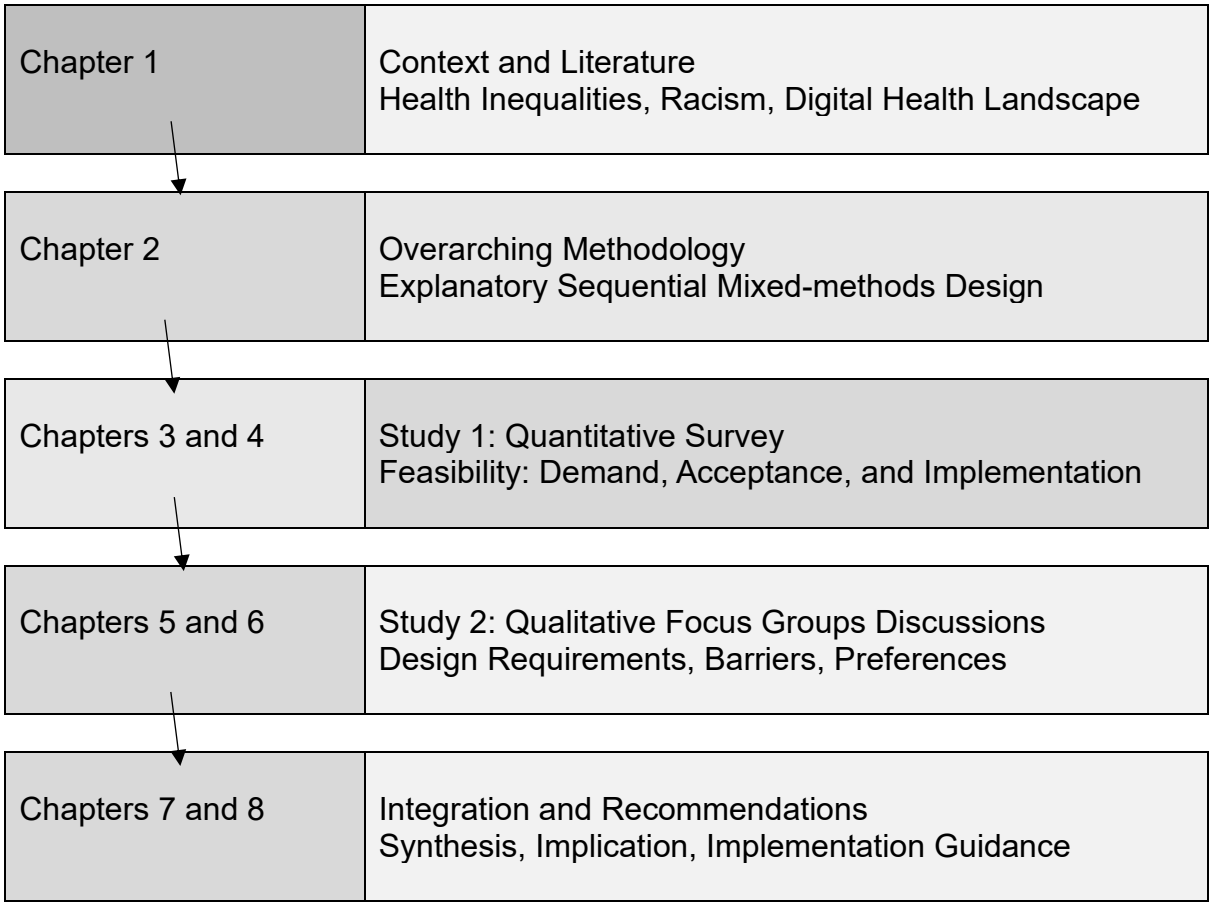

Abbreviations

Abbreviation	Full Term
Advance HE	Advance higher education
BAME	Black, Asian and Minority Ethnic
BCU	Birmingham City University
BLSS	Business, Law, and Social Sciences
BME	Black and Minority Ethnic
BPS	British Psychology Society
CAQDAS	Computers Assisted Qualitative Data Analysis Software
CRT	Critical Race Theory
CVA	Cerebrovascular Accident
DRE	Digital Rectal Examination
FAEC	Faculty Ethics Committee
GCSE	General Certificate of Secondary Education
GM	Global Majority
GP	General Practitioner
HBM	Health Belief Model
HIV	Human Immunodeficiency Virus
IBHO	Improving Black Health Outcomes
IBM	International Business Machines Corporation
MS Teams	Microsoft Teams
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
NIHR	National Institute for Health and Care Research
NPDA	National Paediatric Diabetes Audit

PSA	Prostate-specific Antigen
RCT	Randomised Control Trial
SD	Standard Deviation
SDOH	Social Determinants of Health
SPSS	Statistical Package for the Social Sciences
UK	United Kingdom
UK GDPR	UK General Data Protection Regulation
US	United States
USA	United States of America
WHO	World Health Organisation

Key Terminology and Definitions Used in the Thesis

Black People in England

For this PhD thesis, the term Black people in England refers to individuals residing in England who self-identify as Black or being from any Black background, including those of African and Caribbean heritage. This definition aligns with that used by the Office for National Statistics (ONS, 2021). The population is diverse and encompasses people from various countries and cultures, with different migration histories, languages, socioeconomic backgrounds, and health experiences. This term is used to recognise the shared experiences of racialisation and health inequalities.

Culturally Appropriate Intervention:

Culturally appropriate interventions as used in this thesis refers to interventions that meet these characteristics as defined in Marin (1993): that the design and implementation of intervention align with cultural values of the community, reflect their subjective beliefs, and acknowledge and represent their expectations and preferences.

Gamification

This is used in the thesis as defined in Cheng et al. (2019 p. 2), as “the application of gameful element for non-game purpose”. It involves incorporating game design elements such as points, badges, leaderboards, challenges, progress tracking and rewards, into health promotion interventions with the aim of increasing user engagement and motivation towards a desired behavioural change.

Health Promotion

This term is used in this thesis as defined by WHO (1986) Ottawa Charter which focuses on enabling people to not only take control of over improving their health, but to also provide them with the supportive environment attain their best possible health.

Mobile Health (mHealth) Applications (Apps)

Mobile health applications, frequently referred to as apps in this thesis "*are software applications designed for mobile devices such as smartphones and tablets that could provide health related*" services and interventions (Tuama, 2022). In the context of this PhD thesis, a culturally appropriate health promotion app refers specifically to mobile health app designed with and for Black people in England, incorporating cultural values, preferences and community needs throughout its development and implementation process.

CHAPTER ONE
Introduction and Literature Review

1.0 Overview

Ethnic health inequalities represent a significant and persistent challenge to contemporary healthcare systems in the United Kingdom. Black people in England experience documented disparities across multiple health domains, including higher rates of cardiovascular disease, type 2 diabetes, maternal mortality, and mental health conditions compared to their White counterparts (Bidulescu et al., 2015; Hajat et al., 2001; NHS, 2022; Rayner and Spence, 2021). These inequalities do not result from biological or genetic differences but instead from systemic racism, healthcare discrimination, and structural factors including socioeconomic inequality, employment precarity, and differential access to healthcare (Dudrah, 2002; Nowicka, 2017). The Marmot Review (2020) highlighted that the gap in health inequalities between Black people and White populations in England has been widening, indicating that despite awareness of these disparities, progress toward health equity has been insufficient. This pattern reflects a broader challenge: while health inequalities affecting Black communities have been extensively documented, translating this knowledge into effective interventions remain problematic. Moreover, Black people remain significantly underrepresented in health research (Smart and Harrison, 2017), limiting the development of evidence-based interventions tailored to their specific health needs and contexts. Addressing these longstanding health inequalities requires multi-faceted approaches that move beyond identifying disparities to actively designing and implementing interventions capable of reducing them. Such efforts must be grounded in recognition that health inequalities are rooted in structural racism and discrimination

rather than individual or cultural factors, requiring interventions that address systemic barriers rather than attempting to "fix" communities.

1.1 Equity and Inequality: Conceptualisation and Manifestations Within Black Communities in England

1.1.1 Defining Equity and Inequality: Theoretical Foundations

Understanding health inequality requires first clarifying equity, a term that fundamentally underpins contemporary health policy discourse in England (Wenzl, McCuskee and Mossialos, 2015). The World Health Organisation (WHO, 2010, p.12) defines health equity as "*the absence of unfair, avoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically, or geographically or by other dimensions of inequality (e.g. sex, gender, ethnicity, disability, or sexual orientation)".* This conceptualisation is distinct from related but narrower concepts of equality, which focuses on equal treatment of individuals, thereby facilitating "*equal opportunity to achieve desired*" health outcomes whilst "*eliminating discrimination*" (Health and Care Professions Council, 2020). This distinction proves critical when examining health service provision across England. A universal service model, whereby health-related interventions and digital health apps are deployed uniformly across the general population, can paradoxically contribute to health inequality. Such standardised models may fail to account for the heterogeneous needs, cultural contexts, and differential health status of marginalised populations, including Black communities in England, who experience disproportionate disadvantage across virtually all measured health outcomes (Nazroo and Karsen, 2014). An equitable approach, by contrast, demands differentiated, culturally appropriate interventions that address the specific social and structural barriers affecting these populations.

1.1.2 BAME as Convenience, Not Equity

Often classified under one broad category such as Black, Asian and Minority Ethnic (BAME) or Black and Minority ethnic (BME) group, Black people in England as a standalone group are far from being a homogenous community. The term BAME is often misleading and risks creating the impression that these populations are somehow 'less than' the others, when in fact Campbell-Stephens (2020), argues that a group representing about 80% of the world's population is nowhere near being a minority ethic group. The UK Government (2024) refers to 'ethnic minorities' as "*all ethnic groups except the White British population group"*. They went on to state that the term also includes White minorities such as the Gypsy, Roma and Irish travellers who are collectively referred to as White Other. The broad definition of ethnic minorities could be problematic as it could explain the under representation of Black people in any form of health-related research activities and health service usage, which further questions the cultural competence of the health interventions available in the mainstream. It risks obscuring the specific health needs and disparities affecting Black people because a single collective umbrella term might not adequately represent the varied experiences and needs (NHS Race and Health Observatory, 2024).

To avoid such mischaracterisation and minoritisation of a broad and complex group, Campbell-Stephens (2020) suggested the term Global Majority (GM) instead of BAME or BME. GM reflects a diverse and globally representative group of individuals who make up 80% of the world's population and yet are conveniently misrepresented as a small group of individuals using the reductionist term BAME (Campbell-Stephens, 2020). The term BAME could wrongly give the impression that the group is made up of a small number of minorities, which on its own could provide room for some ethnic groups within the group such as Black people, invisible in terms of their specific needs and requirements. Even when Black people in England are regarded as one separate

group within the Global Majority, there exists a significant diversity ranging from cultural perspectives, health traditions, and technological preferences that may not be adequately addressed within the mainstream health interventions. For example, when compared to Black Africans in England, Black Caribbeans in England have a lower risk for heart failure while Black Africans have a lower risk for treated hypertension (Commission on Race and Ethnic Disparities, 2021). Due to cultural and traditional reasons, Black Africans are more likely to seek alternative mental support from their community leaders, a practice known to delay treatment access up to the point of crisis and therefore could explain the overrepresentation Black Africans in detentions under the Mental Health Act (Devonport et al., 2022). Added to this complexity are language and communication preferences, which include cultural communication styles, humour, and storytelling styles, all of which may be based on the country of origin (Daphne, 2022). These may not be easily captured in the mainstream health apps and therefore potentially widen barriers to their accessibility for the Black community.

Even though the use of umbrella terms such as BAME and BME could be administratively convenient, such categorisation risks homogenising populations with vastly different cultural background, health profiles, and healthcare needs (Aspinall, 2021). This aggregation is particularly problematic in digital health interventions research, where understanding nuanced preferences and barriers is essential for culturally appropriate design. The term BAME itself embeds a deficit-based framing by defining diverse populations negatively as non-White, rather than through their distinct identities and experiences (Okolosie et al., 2015; Richard and Summer, 2022). This approach centres Whiteness as a norm and positions all other groups as deviations from it. Moreover, aggregating ethnic groups under BAME masks specific health inequalities affecting particular communities. For instance, maternal mortality rates

reveal that Black women in the UK are four times more likely to die during childbirth than White women, while Asian women face twice the risk (Felker et al., 2024). Reporting these as a single “BAME disparity” obscures the severity of outcomes for Black women specifically and hinders targeted intervention development. Similarly, Covid-19 mortality data initially aggregated under BAME categories concealed that Black African, Black Caribbean, Bangladeshi and Pakistani populations experienced the highest death rates, while Chinese and Indian populations had comparatively lower risks (Aldridge et al., 2020).

Even within the category “Black,” substantial heterogeneity exists between Black African and Black Caribbean communities in England, with implications for health intervention design. Many Black Caribbean communities descended from the Windrush generation, represent an established UK presence spanning multiple generations (Wallace et al., 2022). These distinct migration histories shape health beliefs, healthcare utilisation patterns and technology adoption behaviours. Mental health service engagement illustrates these differences starkly. Black Caribbean individuals in England experience disproportionately high rates of compulsory detention under the Mental Health Act and are more likely to access services via crisis or criminal justice pathways rather than primary care (Halvorsrud et al., 2018). This pattern reflects both systemic discrimination within mental health services and community mistrust rooted in historical experiences of racism (Memon et al., 2016). Conversely, Black African populations while facing barriers, exhibit more heterogeneous help-seeking patterns influenced by country of origin, migration experience and language proficiency (Bassey and Zaka, 2024). Moreover, cultural explanations of mental health distress vary, with some Black African communities more likely to consult traditional healers or religious leaders before or instead of formal

mental health services (Bailey et al., 2026; Burns and Tomita, 2014). These differences have direct implications for digital health interventions and therefore, a mental health app designed without recognition of these distinct pathways and cultural frameworks risks low uptake and early abandonment.

Language and communication preferences further differentiate the two distinct populations. While Black Caribbean communities predominantly speak English, Black African populations in England represent speakers of over 250 languages at home, with varying English proficiency levels (Mitton, 2011). Digital health interventions assuming English literacy and familiarity with the UK health system terminology may inadvertently exclude recent Black African migrants. Furthermore, cultural communication styles, including story telling traditions, humour and health information preferences vary by country of origin and are rarely addressed in mainstream health apps (Daphne, 2022).

The recognition of this diversity necessitates moving beyond BAME categorisation toward disaggregated data collection and analysis in health research. This shift may enable the identification of specific health inequalities and appropriate targeting of interventions to promote meaningful community engagement in co-design processes. For a culturally appropriate app for health promotion for Black people in England, this means developing content, visual representations, and functionality that acknowledges heterogeneity within Black communities while addressing the shared experiences of structural barriers such as racism.

1.1.3 Social Determinants of Health as Drivers of Inequality

Fundamental to understanding health inequalities in contemporary England is recognition of the role played by social determinants of health (SDOH). Marmot's (2010) comprehensive review of health inequalities in England, '*Fair Society, Healthy*

Lives', identified social factors as the primary drivers of health disparities. SDOH are defined as the environmental circumstances *"in which people are born, grow, live, work, and age"* including the economic, social, and political forces, that shapes the lives of individuals, and how these conditions affect a wide range of health and quality of life risks and outcomes (World Health Organisation, 2025, p.5). Importantly, these factors are conceptualised as the *"causes of the causes"* of health inequalities, reflecting the mechanisms through which upstream structural factors generate downstream health disadvantage (Marmot, 2016). Inequalities manifest across multiple health domains affecting Black communities. Suicide rates, for example, are elevated among young Black African people in England and yet they are under-represented in primary care mental health services when compared with the White British society (Hunt et al., 2021).

In relation to primary care engagement, ethnic minorities, particularly those from Black ethnic backgrounds, experience barriers in accessing mental health services and higher rates of compulsory pathways to mental healthcare compared to other ethnic groups (Devonport et al., 2022; Halvorsrud et al., 2018; Memon et al., 2016). Furthermore, among individuals from ethnic minority backgrounds, systemic racism, experiences of migration-related trauma, and complex experiences of marginalisation are frequently attributed by service users as causes of their mental health difficulties (Bansal et al., 2022). However, mainstream mental health services often lack socially oriented and holistic frameworks capable of addressing such experiences, resulting in what could be termed '*epistemic injustice'* (Newbigging and Ridley, 2018; Newbigging et al., 2024). The NHS England (2024) demonstrates that Black people were 3.5 times as likely as White people to be detained under the Mental Health Act. Yet, Hatch et al. (2016) demonstrate that mental health services were felt to be unresponsive to the

needs of ethnic minority groups with perceptions of discrimination being more prevalent in Black people. This pattern reflects not only inequality of access but inequality of experience and outcomes, with people from Black communities in England experiencing higher rates of physical restrain while detained on mental health wards (Barnett et al., 2019).

The digital inclusion challenges facing Black people in England cannot be comprehensively understood without situating them within the broader landscape of persistent and deepening social and health inequalities that characterise the contemporary British society. These digital exclusions are often fuelled by structural inequalities that often operate across multiple elements of social life, creating what Link and Phelan (1995) term the *'fundamental causes'* of health inequalities, which includes social and economic inequality, and are mainly driven by racism (Nazroo, 2024) which also persist in the digital age. Nazroo et al. (2020) highlighted that the social structures surrounding Black communities often draws upon the ideology of basing physical differences on cultural and social differences. Therefore, understanding the broader concept of social and health inequalities is prudent in creating health apps that are effective rather than adopting approaches that may assume digital exclusion as an isolated technical problem and therefore risk ignoring the deeper structural inequalities that require systematic interventions.

The persistence and deepening of health inequalities in England is worrying and calls for immediate action. The Marmot (2020) review revealed a deeply troubling picture of the widening of the health inequality gap across the social groups. The review revealed that England had for the first time in 100 years, seen no improvement in life expectancy. More worryingly, the review found a decline in life expectancy among women living in the 10% most deprived neighbourhoods. The Marmot (2020) review

is supported by the UK Government data which suggests that minority ethnic groups such as Black people are more likely to live in more deprived areas of the country (GOV.UK, 2020). Despite the absence of change in life expectancy as revealed in the Marmot (2020) review, more people are spending more years lived in poor health, with much steeper gap between the most and least deprived communities.

1.1.4 The COVID-19 Pandemic as Revelation of Structural Health Inequalities

The COVID-19 pandemic provided a pronounced empirical illustration of pre-existing health inequalities within the communities in England. Black people demonstrated heightened risk of COVID-19 related morbidity and mortality when compared to the White population (Chaudhuri et al., 2021; Prats-Uribe et al., 2020). Research examining COVID-19 hospitalisation rates found that when socioeconomic factors and cardiorespiratory comorbidities were adjusted for, Black people demonstrated a significantly higher risk of COVID-19 related hospitalisation than other ethnic groups, suggesting that traditional clinical risk factors do not fully explain these disparities (Patel et al., 2020; Harding et al., 2023). This point to structural violence, which is a systemic and discriminatory factor operating at institutional and societal levels, (Lee, 2019) which put Black at disproportionate higher risk of COVID-19 infection and outcomes. Such argument is supported by the Otu et al. (2020) which demonstrates that even though Black and minority ethnic groups make up only 4.5% of the English population, and 21% of the NHS workforce, they accounted for 63% of all COVID-19 related death for healthcare workforce (Campbell, 2020). These data suggest a combined racialised status with occupational exposure, caused by structural inequalities, that places Black people and other minority ethnic groups in disadvantaged positions that affect their health and wellbeing.

1.2 Conceptualising Culture Within the Black Community: Theoretical Foundations and Applied Implications

Culture is a notoriously difficult term to define, and several definitions do exist in the literature. Providing a single and fitting definition for culture is often challenging and could pose a risk of not distinguishing it from ethnicity and race (Dein, 2004). However, for the purpose of this thesis, the definition by the British anthropologist, Tyler (1870) cited in Spencer-Oatey, and Franklin (2012), will be adopted: Culture is "*that complex whole which includes knowledge, belief, art, moral, law, custom, and any other capabilities acquired" (p. 1)*. This holistic conceptualisation provides a comprehensive framework for examining the multifaceted dimensions of cultural expression within the Black communities, encompassing both tangible practices and intangible belief systems that might otherwise be overlooked or misrepresented in health policy and interventions. The heterogeneity of the Black communities warrants explicit recognition that "Blackness" encompasses diverse cultural orientations, religious traditions, linguistic practices, and historical experiences across the Black African, Caribbean, and other Black backgrounds (Chalik, Leslie and Rhodes, 2017; Nayak, 2012). Conflating cultural identity with racialised categories risks producing a decontextualised and health interventions that are insufficiently nuanced health interventions that fail to account for within-group diversity.

Despite the documented health inequalities affecting the Black communities in England (Joseph-Salisbury, 2020; Marmot, 2020; Nazroo et al., 2007), culturally embedded practices of collective solidarity represent protective resources. Lomotey (2025), demonstrates the communal support and reciprocity with the Black communities in England, which functions as a substantive source of resilience, enabling community members to collectively buffer against systemic stressors and health determinants. Such cultural orientation toward collective wellbeing has

important implications for health intervention design, suggesting that approaches leveraging community networks and mutual support mechanisms may demonstrate enhanced efficacy compared to individualistic interventions (Stamps et al., 2021). The Black Thrive London initiative exemplifies this principle in practice. This community-led network functions as an intermediary between formal service systems, including the NHS, the local council, and police for service provision to the community (Black Thrive, 2022). A central mechanism through which this initiative achieves cultural responsiveness involves embedding mental health support within community spaces and practices familiar to service users, thereby reducing barriers to access and improving engagement with psychological interventions (Black Thrive, 2022). This model demonstrates how formal recognition and mobilisation of cultural assets can enhance both utilisation and outcomes within healthcare contexts.

Cultural practices such as dietary traditions, herbal remedies, and spiritual observances, function as significant markers of cultural identity and community belonging within Black communities (Ojo, 2016; Ojo et al., 2023). Food practices and the associated knowledge systems are often transmitted intergenerationally, and this could carry symbolic weight beyond nutritional function, reinforcing cultural continuity and community cohesion (Ojo et al., 2023). The maintenance and transmission of such cultural practices serve as mechanisms of cultural preservation and intergenerational knowledge transfer, particularly for communities navigating diasporic displacement.

The definition and boundaries of cultural belonging within Black communities are not uniformly constructed; rather, they are contested and negotiated within community spaces. Campion (2019) documents instances of horizontal hostility within Black communities, whereby individuals of mixed Black heritage experienced social marginalisation and questioning of their authentic *"Blackness"* by both Black African

and Black Caribbean community members. This phenomenon illuminates how cultural identity operates beyond visible markers of race. The rejection of mixed-heritage individuals reflects contested understandings of what constitutes legitimate cultural membership, suggesting that inclusion or exclusion from Black cultural communities may hinge upon perceived authenticity regarding cultural knowledge, family lineage, and community participation. These dimensions extend beyond racialised appearance and underscore the necessity of understanding *Blackness* as a culturally constructed category rather than a monolithic or visually determined identity and highlights the importance of accounting for internal stratification and differentiation within ostensibly unified ethnic categories (Nazroo, Bhui and Rhodes, 2019).

Effective health interventions for Black communities in England may require engagement with cultural heterogeneity, recognition of culturally embedded protective factors, and awareness of the contested meanings of cultural belonging.

1.3 Evidence of Disproportionate Structural and Health Impacts on Black People

1.3.1 Racism and the Black Person in England

Employment discrimination and wage disparities represent critical dimensions of the existing structural inequality that significantly impact the lives of Black people in England. The NHS Basic Pay (2021) highlighted that Black men working in the NHS were much more likely to have lower pay than their White counterparts. This report showed that Black people had 16% less pay than the White NHS population, which is a disparity that placed Black men at economic disadvantage. Despite the report showing this disparity affecting Black men, the NHS Race and Health Observatory (2021) denied any form of significant pay gap between White and Black staff. It did however acknowledge that Black people as compared to their White counterparts, were less likely to make it to senior positions, get appointed from shortlisting, or even

believe in the existence of equal opportunities within their institution (NHS Race and Health Observatory, 2021). The NHS England (2025) report on workforce race equality standard for the year 2024 showed 80% of trusts England reported a much higher tendency to employ White applicants from shortlisting than Black people. The report stated that only 42% of Black people believed there was equal opportunities and fair treatment from their trust, with a lot more Black people experiencing bullying and harassment at workplace. The discrimination and unfair treatment of Black people is not only confined to the unequal pay and job opportunities. The account of Tuffour (2022) demonstrated that Black mental health nurses within the NHS often feel discriminated against and marginalised. This often goes to the extent of feeling that they were being denied leadership roles and other career progressions. Such discrimination could have a negative impact on the healthcare workers' mental health, with the possibility of unnecessary stress including those that might be caused by the fear of not attaining professional progression due to racial discrimination (Khan, 2022). Furthermore, not being able to progress to higher position could potentially demotivate younger individuals from the Black community from taking up such careers. Demotivation of individuals from taking up these careers might make it more difficult for Black patients to access Black mental health providers, with 83% of caregivers acknowledging the importance of maintaining the same race among health providers and recipients (Moore et al., 2022).

While racism affects multiple demographic groups, Black people in England have experienced particularly acute and pervasive manifestations of racial discrimination (Parmar, 2013; Phillips and Bowling, 2017; Warwick and Mirza, 2022). The experience of racism for Black people in England is not geographically circumscribed but rather represents a persistent and system challenge across multiple institutions.

These are discussed in much detail in the sub-sections below:

1.3.1.1 Stereotyping, Spatial Stigmatisation, and Healthcare Access

Racial stereotyping, according to Green (2023) is a constructed belief that all members of a particular race share the same characteristics, represents a significant mechanism through which racism operates with both Black communities and broader English society (Phillips and Bowling, 2017). Geographical areas with substantial Black populations are frequently subject to negative characterisation. For instance, certain neighbourhoods in Birmingham where Black residents predominantly reside are often discursively constructed as *'bad dangerous'* and *'dirty'* (Nowicka, 2017), with these spatial stigmas extending to the residents themselves (Dudrah, 2002; Nowicka, 2017). Beyond these stereotypes of criminality and danger, Black individuals have experienced pathologisation within mental health. Metzel (2011), demonstrates how *'Blackness*' was stereotypically linked to madness, giving Black people an overrepresentation in the diagnosis of Schizophrenia, which could have a negative impact on access to healthcare and appropriate support for Black people (Abdou & Fingerhut, 2014), as many Black people may feel afraid to come forward and receive support as they may feel misdiagnosed or be assumed mad (Jones et al., 2013).

1.3.1.2 Racial Profiling and Policing

The United Nations (2019 p. 1-2) defined racial profiling as *"the systematic association of sets of physical, behavioural or psychological characteristics with particular offences and their use as a basis for making law enforcement decisions*". The stereotypical association of *'Blackness'* with criminality has manifested concretely in discriminatory policing (King, 2022). Despite policing ostensibly serving the function of maintaining public safety for all citizens, Barrett et al. (2013) demonstrates that Black young people in England experience racial profiling and dissimilatory stop and search procedures. Barrett et al. (2013) suggested that Black people amongst other ethnically minoritised

individuals in England were thirty-seven times more likely to experience street stops and searches compared to White people, with further evidence suggesting systemic underreporting of these incidents by police authorities. This disproportionate targeting could reflect racial profiling, whereby individuals are treated as suspected criminals based primarily on racial characteristics rather than evidence-based indicators of criminal behaviour (Nadal et al., 2017).

The impact of discriminatory policing extends to Black women in policing roles themselves. Black female police officers with supervisory responsibilities have reported experiencing workplace discrimination from colleagues who questioned their professional competence and legitimacy in leadership positions (Hasan, 2021). Furthermore, Black women in senior policing roles have described experiencing intersecting form of discrimination, whereby their visibility as both Black and women has resulted in exposure to both racial discrimination and sexual harassment (Hasan, 2021). These experiences demonstrate that racism within institutions affects not only those subject to institutional scrutiny but also those employed within institutions themselves.

1.3.1.3 Critical Race Theory and the Architecture of Systemic Racism

The Critical Race Theory (CRT) provides a conceptual framework for understanding how racism operates as a systemic and structural phenomenon rather than merely as individual prejudice or isolated discriminatory acts (Delgado and Stefancic, 2017). Although the CRT was developed in the USA in response to a better understanding of how systemic racism which disadvantaged African American operates, its relevance to the context of Black people in England cannot be overestimated (Delgado and Stefancic, 2000). It posits that racism is normal and ingrained in culture and society in such a way that Black and White people are treated as alike only to remedy the

extreme and shocking forms of inequalities against Black people that may stand out (Delgado and Stefancic, 2000). The everyday business as usual forms of racism that Black people may experience could therefore be ignored or even treated as normal, which may obscure wider society's acceptance of what racism truly means for Black people. The CRT also posits the concept of *"interest convergence",* which postulates that White people and elites will tolerate advances in racial justice in Black people so long as such advances serve their interest (Delgado and Stefancic, 2000). A look at the how racist sentiments have become more tolerated in issues relating to migration in the UK could serve as an example. Racist attacks and sentiments against migrants and People of Colour, by individuals from far-right groups have been justified as reasonable by some Members of Parliament, citing *'legitimate concerns'* to normalise these inhumane and horrendous acts of injustices (The Joint Council on Racist Attacks Across The UK, 2024). Evidence examining institutional approaches to racism suggests that racism is frequently conceptualised at the level of individual actors rather than systematic processes (Patel, 2021; Temidayo, 2025). Bremner (2022) argues that government and institutions often treat racism as an external phenomenon perpetrated by identifiable 'bad actors' rather than as a systemic issue embedded within institutional structures and decision-making process. These framing risks obscuring the structural conditions that enable racist practices to persist. For example, when high ranking government officials advocate for preventing 'racist individuals' from accessing positions of authority, such approaches assume that racism can be eliminated through careful personal selection (Bremner, 2022). However, without suitable mechanisms for identifying and dismantling the structural conditions that enable racist discrimination, individual level intervention may prove insufficient. Institutions, therefore, face an

imperative to develop comprehensive frameworks that address the systemic roots of racism rather than focusing narrowly on excluding individuals categorised as racist.

1.3.1.4 Racism in Educational Settings

Educational institutions have not been exempted from racist practices and their harmful consequences. The evidence suggesting that bullying could result in life changing experiences is overwhelming. One example is the unfortunate story of a Somali girl, who was severely bullied in school due to her skin colour and was subsequently found dead in Greater Manchester's River Irwell (Joseph-Salisbury, 2020). Evidence suggested that school staff were aware of her experiences but failed to implement adequate safeguarding measures (Joseph-Salisbury, 2020). This incident raises critical questions regarding whether equivalent protection and intervention would have been provided to victims of different backgrounds. The composition of school staff presents an additional concern. Teaching workforces in England are predominantly White, with Black and ethnically minoritised individuals disproportionately concentrated in lower-status roles such as teaching assistants, personal assistants, and support staff (Joseph-Salisbury (2020). This occupational segregation creates limited opportunities for Black students to encounter role models in professional teaching positions, potentially signalling that that certain career trajectories are not accessible to individuals of minoritised racial backgrounds (Everage, 2023; Jabbar et al., 2022). The broader implications may relate to both career aspirations and perceptions of social mobility among Black students.

1.3.1.5 Conditional Belonging and Racial Visibility

The concept of conditional belonging, wherein Black people are accepted as fully national subjects only when they meet predetermined standards of performance or behaviour, represents another dimension of racism in contemporary England. This was

starkly illustrated following the 2021 European Football Championship final between England and Italy. Three Black players who had performed for the England national team throughout the tournament faced severe racial abuse following their unsuccessful penalty kicks (Mauro, 2024). As noted by footballer Jude Bellingham, the players who had been celebrated as English representatives during successful matches were subsequently rendered visibly Black and excluded from English national identity following a sporting defeat: "*we had players of all different backgrounds, from all different countries in the team. And then as soon as they missed the penalty, they're not English, they're just Black"* (Mauro, 2024). This dynamic illustrates that for Black individuals, national belonging and acceptance remain contingent upon continuous performance and achievement, with failures or setbacks triggering a reassertion of racial otherness.

1.3.2 Black People and Educational Inequality in England

The awarding gap that disproportionately affects Black people through which educational inequality can be better understood. Almost 80% of White people receive a first or 2.1 award, while almost 50% of Black people in England receive lower awards (Advance HE, 2025). In addition, Advance HE (2025) suggested that Black people are far less likely to obtain first-class or upper second-class degrees than any other ethnicity, and that students who have had bad experiences in higher education or felt they were not given the right opportunity to grow in their learning, were less likely to want to be academics. This could therefore explain the underrepresentation of Black people in academia (Alexander and Shankley, 2020), which further poses concerns on culturally appropriate mentorship for Black students. Hart (2020) demonstrated that Black instructors could improve the enrolment of Black students in universities by 2%. The widened awarding gap is not only unique to higher education. Alexander and

Shankley (2020), demonstrated that Black pupils were less likely to be high achievers in the GCSE level even when compared to other minority ethnic groups such as Chinese and Indian pupils. In addition, Black pupils were the least likely to be admitted to the Russel Group universities than any other race (Boliver, 2016), which could explain their under-representation in these universities. This therefore indicates that resolving the awarding gap in education requires interventions that go beyond focussing on the universities but rather take a holistic approach that focuses on and empowers the Black community. Students experience could impact their learning and therefore could have a direct impact on the awarding gap. Black students have faced several challenges in universities including feeling isolated and being subjected to some form of racism within university campuses or student accommodations, which could reduce their confidence and negatively impact their learning (Bruce et al., 2019). The accounts of Bunce et al. (2019) and Demie (2019) highlighted how some Black students perceived being judged by their skin colour and accents and being constantly under pressure to behave in a way that was compliant with being *'non-Black and Ethnic Minority norms'*. Demie (2019) further shed light on how some Black students were under constant pressure of trying to fit in within the education community and therefore are forced to behave in a specific way in order not to be perceived as inferiors. Moreover, Black boys are more likely to be wrongly perceived as expressing *'aggressive'* or demonstrating some challenging behaviour due to their physical appearance and racial stereotyping. These challenges could impact on the students' mental wellbeing, which according to Abdullah et al. (2020), is directly proportional to students' academic performance. This is further supported by Gougis, (2020) which showed that race prejudice was associated with emotional stress, which in turn had a negative impact on motivation to learn among Black Americans. It is therefore prudent

to say that awarding gap that disproportionately affect Black people far more than any other ethnicity is not just a matter of students' performance but could have detrimental impact on mental wellbeing and the wider Black community. It therefore necessitates urgent and appropriate intervention.

1.3.3 How Economic Inequality Translates to Health Inequality in the Black Community in England

Having a stable source of income could be one of the most important determinants of health (Marmot, 2005). The COVID-19 pandemic brought more clarity to the fact that Black people among other minority ethnic groups were more economically susceptible to the negative economic impact of the measures put in place to curb the spread of COVID-19 (Platt et al., 2020). Some of these measures required people to stay and work from home if they could, unless they were regarded as essential workers such as care home workers, and delivery drivers. Black people were more likely to be in such jobs that did not allow for the flexibility of working from home, which therefore placed them at greater risk of contracting COVID-19. This could explain why Black people were 3.1% more likely to lose their jobs than their White counterparts during the COVID-19 pandemic in the UK, as many of the jobs that could not be performed remotely and were not deemed essential under the COVID-19 regulations were lost (Hu, 2020). This left Black people overrepresented in jobs rated as high risk for contracting COVID-19 infection, such as working in care homes as carers, nursing assistants and cleaners (Platt, 2021). Moreover, they were more likely to be self-employed or in an employment that had to shut down due to COVID-19 control measures (Platt et al., 2020). Concerning the reliance of personal savings during financial hardships, only 30% of Black people were in households that had sufficient savings to sustain them for a month, unlike the 60% of the White community that could sustain themselves for a month, if they were to lose their source of income (Platt et al.,

2020). Being in such a situation of destitution could explain why Black people were more susceptible to COVID-19 infection besides having one of the worst Covid-19 outcomes. They had to undertake more high-risk occupations associated with Covid-19 exposure to survive the financial hardship. This phenomenon is not new to Black people, as history demonstrated that due to deprivation, Black people in South Africa were forced into the labour force to secure economic survival during the Tuberculosis epidemic that claimed the lives of many (Packard, 1989).

1.3.4 Racism Impacts Black Peoples' Health In England

Experiencing racism, whether institutionally, interpersonally, or internalised, is associated with poor health outcomes across multiple dimensions of physical and mental wellbeing (Paradies et al., 2020). In England specifically, longitudinal research has demonstrated that experiences of racial discrimination precede poor health, and changes in racial discrimination are associated with changes in mental health, indicating direct causal pathways through which racism damages health (Hackett et al., 2020).

The COVID-19 pandemic starkly illustrated the health consequences of racism for Black people in England. The disproportionate exposure and death of Black people and other ethnic minorities could be linked to a number of factors including racism (Iacobucci, 2020). According to Stopforth et al. (2022) people exposed to racism experienced poorer health outcomes.

Beyond direct experiences of discrimination, the disproportionate COVID-19 burden on Black communities reflects deeper structural mechanisms rooted in systemic racism. Black African workers were significantly overrepresented in frontline health and social care occupations, with more than 2 in 10 Black African women of working age employed in health and social care roles (Platt et al., 2020). In addition, up to 41% of

Black African origin were estimated to be working outside their home during national lockdown, compared with 27% of White workers, and those from Black African background were more than twice as likely to use public transportation to travel to work compared with people from White background (Runnymede Trust, 2020). Among healthcare workers specifically, Black employees demonstrated 110% excess risk for COVID-19 infection during both the first and second waves of the pandemic, with higher risk persisting even after controlling for age, sex, pay grade, residential environment, type of work, and time spent in occupational exposure at work (Inghels et al., 2022). Unequal housing conditions also facilitated viral transmission. The rate of overcrowding was higher in Black African households when compared with that of White British households (Office for National Statistics, 2020).

Not having access to tailored and much-needed healthcare could impact health negatively. A randomised controlled trial, Alsan et al. (2019) demonstrated that assigning Black doctors to a Black population could reduce the gap between White and Black male mortality rates due cardiovascular disease by up to 19%. This finding raises questions as to whether such health gap reduction is due to identity, trust or other facilitators that could be fostered by assigning Black healthcare providers to Black communities, and the fact that such intervention is needed to reduce the health gap requires more investigation. The study also showed that Black patients were more likely to engage with preventative services and as well as invasive procedures if it was offered by a Black doctor. This pattern of selective trust could be explained by lack of trust or racist experience in the hands of non-Black healthcare providers (Ridge et al., 2023). The findings from Alsan et al. (2019) highlights the possibility that the non-health seeking behaviours such as low engagement with NHS health checks including vital

screening programs (Coghill et al., 2018) could be attributed to not having access to culturally appropriate interventions.

1.4 Disproportionate Health Impacts for Black People in England

There are several diseases and health conditions that continue to pose health challenges both to the general population in England and its Black populace. Despite these health challenges disproportionately impacting Black people (Bidulescu et al., 2015; Goff, 2019; Kerrison et al. 2021; Ntuk et al., 2014; Wright et al., 2020), access to healthcare for Black people is often obscured by barriers such as stigma and mistrust of services (Devonport et al., 2022) necessitating culturally appropriate health promotion interventions to address such challenges. According to the Office for National Statistics (2023), ischemic heart diseases, stroke and cancer were among the leading causes of death which accounted for 41% of all deaths in England in the year 2022. Details on the magnitude and how these diseases disproportionately affect the Black population are further discussed below.

1.4.1 Diabetes Mellitus

Diabetes Mellitus is *"a group of metabolic diseases characterized by hyperglycaemia resulting from defects in insulin secretion, insulin action, or both"* (American Diabetes Association, 2007, p. 542). Its symptoms, which are usually due to hyperglycaemia, include: polyuria, polydipsia, feeling very tired, unintentional weight loss, delayed wound healing, polyphagia, and blurred vision (National Health Services, 2020). Up to 7% of the UK population has diabetes (Whicher et al., 2020). Despite this high prevalence, the management of Diabetes in the UK has been highly effective, as the country was ranked fourth in diabetes care among 30 European countries (Garrofé et al., 2014). This achievement carries a significant cost, as the National Health Services (NHS) spends £10 billion annually on diabetes care (Hex et al., 2012). This huge cost

on the NHS and taxpayers is not the only problem associated with diabetes. The distribution of diabetes in the populace poses as evidence of inequality affecting Black people in England. Black people are more susceptible to type 2 diabetes than their White counterparts (Pham et al., 2019). The prevalence of diabetes in minority ethnic groups including the Black community in England could be four to five times higher than it is in the White population (Goff, 2019; Ntuk et al., 2014). When compared to White people specifically, Black people in England are almost three times more likely to be diagnosed with Diabetes (Emmett et al., 2025). In addition, Black people tend to present at a much earlier age than their White counterparts (Emmett et al., 2025). They are generally 9 -10 years younger than the White populace when they present with diabetes (Emmett et al.' 2025; Wright et al., 2020; Wang et al., 2012).

If left untreated, diabetes mellitus could lead to acute life-threatening consequences such as hyperglycaemia with ketoacidosis, and nonketotic hyperosmolar syndrome (American Diabetes Association, 2007). These long-term complications of diabetes are devastating and can cause long-lasting disability. They included retinopathy, nephropathy, peripheral neuropathy, diabetic foot ulcers leading to amputations, Charcot joints, and sexual dysfunction (American Diabetes Association, 2007). Diabetes increases stroke susceptibility by 2-6 times (Maida et al., 2022), and when diabetic patients experience acute ischaemic stroke, they are more likely to die and less likely to benefit from the standard treatment including intravenous plasminogen activator (Maida et al., 2022). Moreover, Wamil et al., (2021) suggested that diabetes patients with insulin resistance are more likely to develop heart failure and to die than those who are regarded as insulin sensitive.

Keeping glycaemic control optimum is the gold standard in managing diabetes, and this is monitored through regular testing of the HbA1c, which is also referred to as

glycosylated haemoglobin. According to the NICE (2021, para. 3), it reflects the *"average blood glucose level over the last 2 to 3 months"* and keeping it around the normal range forms an integral part of diabetes care and management. NICE recommends that this test should be carried out every 3-6 months in patients diagnosed with diabetes. A higher level of HbA1c equates to greater risk of developing diabetic complications (Lind et al., 2009). However, Black people were less likely to have their HbA1c measured due to their greater tendency of not showing up for testing, which therefore reduced chances of being started on insulin when compared to the White population (Mathur et al., 2020). This could be due to the lack of culturally appropriate health promotion interventions that enable the Black community in England to approach health from a preventative perspective rather than a pathogenic one, which focuses on the treatment of disease as suggested in Hossain et al., (2025). The NHS Health Check Focus Groups Report (2025) suggested that some members of the Black community in England do not perceive the need to have a regular NHS health check as long as they feel young and able to carry on with their normal daily routines.

Regarding diabetes care and management, Sedgwick, Pearce and Gulliford (2003), argued that there was no racial difference in access to diabetes care in England. However, a systematic review by Majeed-Ariss et al. (2013), revealed that inadequate knowledge was a significant barrier to accessing care in the Black community. This knowledge gap in patients diagnosed with type 2 diabetes ranged from not having adequate knowledge of what a healthy diet was, to others such as not knowing the importance of taking medications as prescribed, and negative perceptions of insulin use. This challenge was not only confined to diabetes type 2. The National Paediatric Diabetes Audit (NPDA) Annual report 2019-20, stated that a high HbA1c was seen

more common in Black children than among any other ethnic groups, which suggested a deficit in access to adequate and culturally appropriate care for these children and their families.

The use of technology in diabetes care and management has been promising, but Black people in England are less likely than any other ethnicity to use such technological advancement (Parkin and Barnard-Kelly, 2022). This therefore necessitates an innovative and culturally appropriate health promotion approach that will address the barriers that contributes to the existing health inequalities and gaps that exist in the Black community in England.

1.4.2 Cerebrovascular Accident (CVA) or Stroke

Cerebrovascular accident, often referred to as stroke is another health challenge for the UK and the world at large. It is defined as *"a serious life-threatening medical condition that happens when the blood supply to part of the brain is cut off"* (NHS, 2023, para. 1). In 2013 alone, there were 6.5 million deaths from stroke globally (Feigin et al., 2015). It was in fact, the leading cause of death and disability in the UK accounting for 38,000 deaths per annum, and with an incidence of about 100,000 cases per annum (NICE, 2023; Stroke Association, 2018). Despite a risk twice as high as that on the White population (Wang et al., 2013), the prevalence of stroke in Black people in England ranges between 40% and 70% higher than that of the general UK population (Bradford District NHS Trust, 2016). With recent advances in health and wellbeing, Kleindorfer et al. (2010) demonstrated that the incidence of stroke had significantly reduced in the White population but remained unchanged among the Black people. Such inequality in health and health outcomes is also supported by Wang et al. (2015), which revealed a decrease in the prevalence of stroke in the London's White population by up to 40% over the past two decades, while no

significant change was recorded in the Black population. Emmett et al. (2025) investigated the ethnic differences and the outcome of stroke for up to 5 years following a stroke. This study also suggested that Black people present much younger and with higher prevalence of hypertension than the White population in England.

Concerning risk factors for stroke, a systematic review of clinical trials established that hypertension and diabetes mellitus are considered high risk factors for stroke (Alloubani, Saleh and Abdelhafiz, 2018). Both health conditions were more prevalent in the Black stroke population than any other races' (Hajat et al., 2001). Looking at all the risk factors for stroke when considered independently, hypertension stood out as the most prevalent risk factor (Feigin, Norrving and Mensah, 2017; O'Donnell et al., 2010), and its prevalence in the Black population is much higher than any other racial group. This is particularly severe among Black Caribbeans than it is in the Black African (Bidulescu et al., 2015). Despite this disparity, Black people are less likely to have their blood pressure controlled, which in turn place them at a higher risk for stroke (Rayner and Spence, 2021). Moreover, the systematic review by Bidulescu et al. (2015), revealed that Black people in low socioeconomic status were at higher risk of hypertension and its complications such as stroke. This evidence supports a link of socioeconomic disparity to poor health outcomes and therefore requires an innovative culturally appropriate measure to address it.

Understanding the perspectives of Black people towards illness, especially those to which they are more susceptible to, could add value towards the prevention and management of such diseases in the Black population. In a systematic review and meta-analysis, Khatib et al. (2014) revealed that lack of or limited knowledge of hypertension risk factors was one of the key factors that hindered hypertension management. These modifiable risk factors included*: "poor diet, high salt and fat*

intake, and lack of physical activity." This systematic review also revealed that some hypertensive patients reported a need for health education on the management and prevention of the disease. The findings from this review were supported by Ige-Elegbede et al. (2019), a systematic review which looked at barriers of physical activities in the Black and Minority Ethnic (BAME) groups. The review suggested that Black people and minoritised ethnic groups lacked or had limited knowledge of the link between physical activity and health.

1.4.3 Cancer

Cancer is the second leading cause of death globally, and it accounts for 1 in every 6 deaths (WHO, 2019). The UK is ranked among the one third European counties with the highest incidence of cancer, with an annual record of 367,000 new cases (Cancer Research UK, 2018). Even though survival from cancer in the UK has doubled in the last 40 years, one in every four deaths results from cancer (Cancer Research UK, 2017).

The early detection and management of cancer is associated with a much higher survival rate (Midthun, 2016). Cancer screening therefore forms a vital component in the fight against cancer. It involves testing for cancer in individuals with no symptoms of the disease to detect it in its earliest stage possible and offer treatment that may stop or reverse the condition (National Cancer Institute, 2018). According to the National Health Services (NHS, 2018) the aim is to offer screening to those who will benefit most from it, which therefore means, periodic invitations are sent to selected individuals for screening from specific cancers. Kerrison et al. (2021) revealed that when compared to the White population, Black British people were less likely to be aware of risk factors for cancer and screening programs and were therefore less likely to undergo screening. Moreover, Copson et al. (2014) suggested that the Black women

in England were more likely to present late with breast cancer and therefore had significantly worse outcomes than the White population. In addition, they presented with breast cancer about twenty years younger than their White counterparts (Dindyal et al., 2008), even though they seemed to have a lower incidence of cancer than the White population (Gathani et al., 2013).

Prostate cancer is another form of cancer that disproportionately affects Black British men. Dee et al. (2024) examined at the similarities and differences in the racial disparities in prostate cancer for Black men in the UK and USA. They suggested that despite the disparity when compared to the White counterparts in both countries, Black men in USA are twice as likely to die of the condition, while Black men in the UK are three times as likely to die of it. This does suggest a significantly greater burden in Black men in England. This is supported by Butler et al. (2020) which suggested that despite Black people being two to three times more likely to develop fatal prostate cancer in both the countries, the USA has seen an annual decline in prostate cancer of -7.5%, while England continues to register an annual increase of 7.7% (Butler et al., 2020). In addition, Black men in England present five years younger than the White population (Metcalfe et al., 2008). These disparities are not without solutions. Dee et al. (2024) suggested that equal access to health care stood as a potential resource for eliminating such health inequalities. They suggested an investment in culturally appropriate interventions that take into account the cultural beliefs and social contexts that are intertwined with the Black peoples' wellbeing.

Concerning cancer awareness and management, Niksic et al. (2016), revealed that Black British were less likely to be aware of cancer symptoms than the White population. This was supported by Forbes et al. (2011), which found that Black British women were less likely to be aware of and recognise breast cancer symptoms when

compared to their White counterparts. The view of Black people towards cancer was another factor that needed understanding. Mulugeta et al. (2017) revealed that Black people in the UK do not see cancer as a Black peoples' disease. Instead, it was argued that the NHS made Black people aware that some health conditions such as sickle cell disease and HIV/AIDs were theirs, but this was not the case for cancer. Mulugeta et al. (2017), revealed that Black British men were therefore not aware of the fact that people from their community were more likely to be diagnosed with prostate cancer than any other race. According to this study, Black men believed that cancer was not a disease of the Black population.

Even when awareness of cancer was not an issue, the cultural barriers stood against having cancer screening done for many Black men. In the Black community, health seeking behaviours such as cancer screening is not associated with being 'a man.' Harvey and Alston (2011) demonstrated that Black men do feel that they are expected to stay strong and healthy and therefore do not need to consult health practitioners unless absolutely necessary.

The absence of pain in some forms of cancers is another hindrance to care seeking attitude. According to Jones et al. (2015), the absence of pain was found to be one of the barriers towards Black British women having an early diagnosis of breast cancer.

The use of mobile phone apps for cancer awareness and preventions especially those that focus on smoking cessation is so far promising (Coughlin et al., 2016), but there a is need for such apps to be focussed on the specific needs of targeted communities. A culturally appropriate health promotion app for Black people could therefore be a suitable medium to deliver such intervention.

1.5 Delivering Culturally Appropriate Health Interventions for Black People in England

There have been several efforts geared toward addressing the ethnic health gaps caused by inequality. One such initiative is the Improving Black Health Outcomes (IBHO) BioResource which focusses on learning more about health conditions and their impact on the Black communities in the UK (*IBHO BioResource,* 2024). This could help address the longstanding under-representation of Black people in the research of health condition specific to the Black community (Asher et al., 2022; Smart and Harrison, 2017). A positive impact is the newly developed improved NHS blood matching test that could reduce transfusion side-effects for people with inherited disorders such as sickle cell disease, which is highly prevalent in the Black community (NIHR BioResource, 2023). Such interventions could also lead to a better understanding of cardiovascular diseases, which is another burden to the Black community (Bidulescu et al., 2015; Eastwood et al., 2023; Tapela et al., 2021), paving the way to better response to the unique genetic and environmental factors that contribute to disease and wellness in the Black community.

An approach to delivering a culturally appropriate intervention is the use of community-led models, which focus on prioritising what people say is important to them when considering interventions aimed towards improving their health (Scottish Community Development Centre, nd). The focus here is on community, which according to Public Health England, (2018, p.3) represents *"relationships, bonds, identities and interests that join people together or give them a shared stake in a place, service, culture or activity*". Community-led models demonstrate effectiveness in improving health outcomes for Black populations in England. Community engagement models utilising trained wellbeing champions from African and Caribbean communities have proven effective in raising mental health awareness and encouraging help seeking, especially

when integrated with faith-based organisations and local services (Mantovani et al., 2017). Similarly, culturally adapted family interventions (CaFI) co-produced with Black Caribbean service users and families experiencing schizophrenia showed that Black communities were highly motivated to engage in research when genuinely invited to co-design solutions (Edge et al., 2018). These examples illustrate that when Black communities lead intervention design and delivery decisions, health outcomes are more culturally appropriate and effective, emphasising the critical importance of authentic community partnership. These models therefore identify community health assets such as individual skills and knowledge; relationships including friendships and networking within the community; resources relating to physical, environmental and economic factors that could influence wellbeing; and the external factors from both public and private entities that are within the reach of the community (Public Health England, 2018). Public Health England (2018) stressed that these assets could be helpful in building Social Capital which could further be a resource that could reduce the cost of healthcare, as it enables individual members of a community to work together and maximise the use of the resources available to them. Given the widening gap of inequalities between Black people and their White counterparts in England, as highlighted in the Marmot (2020) review, it is prudent that policy makers consider this approach which could maximise positive impact of interventions within the community. An important aspect of community-led approaches is that it could foster trust and acceptance of an intervention. A community-led approach is one of the mechanisms through which trust could be fostered. It offers a unique opportunity for communities to visualise the impact of their voices and therefore are more likely to take ownership of interventions co-created with them (Enria et al., 2021). An example is the findings from the Scientific Advisory Group for Emergencies (2022) which highlighted the

importance of not treating minority ethnic groups as one homogeneous group that share the same views and values. Instead, the document stressed on the use of targeted messages to achieve wider collective aim. It further highlighted the importance contextualising data when interpreting its meaning, and to consider parameters such as socioeconomic status, and lived experiences, which might differ within what could be assumed as a homogeneous community. The perception of being wrongly represented or target could raise trust concerns.

Although proven effective, delivering a culturally appropriate intervention is not without challenges. One important challenge is funding, as community-led initiatives such as the Black Thrive London, are often voluntary and lack adequate funding since they mainly depend on grants and donations (Black Thrive Global, 2025). Moreover, since the community-led interventions focuses on guaranteeing a culturally sensitive interventions to the members of a target community, there is no guarantee that such culturally sensitive approach will be encountered by the members of the community if they sought healthcare services from the wider NHS health facilities. Moreover, such interventions are not often backed by a national policy which according to Muhunthan et al (2017), is necessary for a much greater impact on health and social outcomes.

1.6 The Role of Health Promotion in Reducing Health Disparities

1.6.1 Health Education as a Health Promotion Approach

Health promotion as defined in the World Health Organisation's (WHO, 1986) Ottawa Charter for Health Promotion is *"the process of enabling people to increase control over, and to improve their health"* with the aim of helping individuals and groups achieve complete *"physical, mental and social wellbeing by identifying"* and realising *"aspirations, satisfying needs, and adapting to their environment*". Rather than focusing solely on individual health behaviours, health promotion operates as a

comprehensive, multi-strategy approach encompassing five key action areas: building healthy public health policy, creating supportive environments for health, strengthening community action, developing personal skills, and reorienting health services (WHO, 1986). These according to the WHO (1986) are underpinned by three core strategies of advocacy, enablement, and mediation, recognising that the prerequisites for health extend beyond medical care provisions. Health education forms an important part of health promotion and could be an effective means of breaking barriers to better health. It is defined as *"the process by which people are given information needed to exercise a greater degree of control over their own health"* (Levine OBE and Stillman-Lowe, 2024, p 181). Key to this definition is the degree of control over one's own health. Even though this approach guarantees a degree of autonomy as people are offered information and are then left to take control over their own health (Levine OBE and Stillman-Lowe, 2024), the evidence discussed in previous sections suggests that the degree of control for many people within the Black community could be minimal, as factors such as the social determinants of health and the structural factors around them might hinder ability to take control over some health-related behaviour. Many of the structural barriers to health improvement have been slow to change and therefore improving health education would allow better control in terms of access to information needed to improve health outcomes. Health education could be a vital tool to promote knowledge, attitude, and build skills that could positively impact on health behaviours for both individuals and communities, if delivered in a culturally appropriate way (Orbell et al., 2013). It improves locus of internal control and therefore increases a person's chances of performing a health-related behaviour (Arshad, 2018). Internal locus of control goes beyond having high self-control to take charge over health-related behaviour, it increases the positive impacts of self-control that could positively promote

health (Botha and Dahmann, 2024). Moreover, it helps individuals to have a better control over diseases, and therefore lessens the impact a disease might have on an individual's life (Agide et al., 2018; Garg et al., 2019; Vandenbosch et al., 2018). This does not however rule out that providing information alone is not a guarantee that a desired health related behaviour will be achieved (Kenkel, 1991), as some desired health behavioural change require the social and structural determinants to be addressed, and this might be beyond the individual's reach (Albarracín et al., 2024). This therefore suggest a need for a culturally appropriate health education. The National Institute for Health and Care Excellence (NICE) (2015) advised that health education should not only be evidence-based, but it should also be person-centred addressing the needs of an individual or a community. A person-centred health education should therefore take into consideration, the ways through which cultural barriers among others, could be broken in minority ethnic groups such as the Black community in England (Dyson et al., 2018).

Culturally appropriate health education has proven to work in many instances. Its use in manging chronic and non-communicable diseases is well documented (Joo and Liu, 2020; Singh et al., 2022; Truong et al., 2014). Creamer et al. (2015) demonstrated in their Cochrane review, that a culturally appropriate health education was effective for a sustained glycaemic control and improved diabetes knowledge amongst patients diagnosed with the health condition. Khanal et al. (2021) demonstrated that a community-focussed health education was effective in improving knowledge and reducing blood pressure in poorly controlled hypertensive patients. This randomised control trial compared two groups of hypertensive patients, with one receiving care as usual while the other had health education tailored to the needs of the community, added to their usual care. The group with added tailored health education did much

better with blood pressure control and improved knowledge of hypertension, proving that when health education is tailored to a community's needs, its effectiveness will more likely be achieved. This finding is similar to Attridge et al. (2014) which showed that a culturally appropriate health education had a positive impact on the glycaemic control of diabetic patients. Moreover, Creamer et al. (2016) suggested that a culturally appropriate health education could yield a better outcome in the management of diabetes as compared to the conventional management alone.

1.6.2 Digital Technology for Delivering Culturally Appropriate Health Promotion

The use of digital technologies to deliver culturally appropriate health promotion interventions has proven effective. In a systematic review, Salonen, Ryhänen and Leino-Kilpi (2014) demonstrated that a computer-based health education was effective in increasing men's knowledge of prostate cancer and their satisfaction with treatment and support. Men, especially Black men often perceive digital rectal examination (DRE) as *'homosexual and violation,'* which hinders their willingness to take part in prostate cancer screening (Pedersen, Armes, and Ream, 2011). However, administering a web-based health education on Turkish men was found to increase their rate of having a prostate examination by more than 100%, and as well as increased the rate of taking a PSA test by at least 5-fold (Çapık and Gözüm, 2012). The web-based health education was adaptable and user friendly as it allowed various channels of health message delivery such as reminders through emails, and cell phone messages. Such was found effective in improving behaviour towards health screening, health belief, and knowledge (Çapık and Gözüm, 2012). Therefore, a health education focussed and tailored to a specific community's need could be an effective tool for disease awareness and control. Mota et al. (2023) is a systematic review that studied the use technology to deliver health education regarding HIV prevention in Black

people. The review showed a reduction in high-risk behaviours such as unprotected sex, an increased use of condoms, reduction in the number of sexual partners, and more HIV testing request following the health education intervention delivered through mobile technology. Their finding is supported by Jones et al. (2024), a systematic review which compared the effectiveness of apps that had personalised features which users could adopt as they wished, with health apps that were culturally tailored to specific populations. This review demonstrates a superiority in effectiveness of glycaemic control and nutrition plan for those apps that were culturally tailored to a specific population, over those had personalised features added. This evidence suggests that developing a culturally appropriate health promotion app for Black people in England is likely to be more beneficial in promoting Black peoples' health, than relying on the personalised features in the contemporary health apps.

1.7 The mHealth and Apps: Potential Impact on Health Promotion in Black Communities

1.7.1 Digital Health Apps: Societal Importance and Inequalities

Access to information, communication, and engagement with services has been revolutionised by the wake of digital advancements. Mobile phone applications (apps) have become ubiquitous tools that mediate daily interactions with healthcare, education, employment, and social services. Its adoption in the United Kingdom has reached unprecedented levels, making its use in health-related approaches becoming increasingly widespread (Chidambaram, et al., 2020). Although this technological advancement is positive, it has created an environment where digital literacy and access to culturally sensitive digital tools such as mobile phone apps become essential for full participation in contemporary society (Bandura and Leal, 2022; Lohr, 2025).

The proliferation of mobile health (mHealth) globally, exemplifies a demonstration of potential impact in addressing health disparities, improving health outcomes, and

enhancing healthcare accessibility (Okolo et al., 2024). This could be due to its ability to provide convenient health information access with personalised recommendations, and reminders that could improve engagement with desired health improving behaviour (Okolo et al., 2024).

One of the key impacts of the COVID-19 pandemic is that it has accelerated digital transformation of healthcare services, making digital health service inclusions such as the NHS COVID-19 App, online GP, and mental health services a matter of public health urgency. This urgent shift to a much-needed digital transformation did expose the existing inequalities and highlighted the critical importance of ensuring that digital health solutions such as mobile apps are accessible and relevant to all communities (Radu et al., 2023). The pandemic therefore demonstrated that those who do not have adequate access to, or digital skills, run the risk of facing compounded disadvantages in accessing essential services. Moreover, smartphones have become ubiquitous among low-income populations, for whom mobile devices often represent the primary means of internet access, which is often used to access health related information (Sharma et al., 2022). However, the benefits of digital health interventions are not equally distributed and accessed across all population groups. Even though minority ethnic groups such as Black people in England, are more likely to experience reduced access to health services (Devonport et al., 2022; Majeed-Ariss et al. 2013; Mulugeta et al. 2017; Niksic et al. 2016) and generally present with worse health outcomes than the rest of the population (Bidulescu et al., 2015; Nazroo and Karsen, 2014; Rayner and Spence, 2021), there is disparity in access to culturally competent content in most apps available in the market. In addition, Radu et al. (2023) indicated that about half of all the health apps found in the market did not in any way involve their intended users in their development process, which therefore risks omission of key cultural

consideration. Even where health app developers claimed they involved the expected users in the apps' creation and commissioning, only a small fraction of these developers maintained such involvement consistently throughout the process of designing, creating, and commissioning of the app to the expected users (Radu et al., 2023). Such expected user engagement and involvement in the design, creation and commissioning of health apps is important in fostering trust and acceptance as it drives the spirit of ownership for such health apps (Radu et al., 2023).

Beyond healthcare, mobile apps have become integral to accessing education, employment opportunities, financial services, and government services. Mistry and Jabba (2023) identified three essential elements necessary for people to begin using digital public services: *'an electronic device, connectivity data, and the necessary skills and confidence'*. Although this recognition led to more investment in digital inclusion initiatives (The King's Fund, 2025), significant gaps in access, resources and knowledge within the Black community do persist. The social implication of digital exclusion goes beyond individual disadvantage as it could affect community cohesion and social mobility. Du et al., (2020) demonstrates that communities that lack access to culturally appropriate digital tools may find themselves increasingly marginalised from mainstream digital services and opportunities. Thus, this digital divide could perpetuate existing inequalities and create new forms of social stratification based on technological access and digital literacy.

1.7.2 Challenges of Digital Inclusion and Representation for Black People in England

Digital inclusion remains a significant challenge for Black communities in England, with multiple intersecting factors contributing to ongoing disparities in digital access, usage, and representation (Mistry and Jabbal, 2023). Approximately 8.5 million adults in England lack basic digital skills, predominantly from socio-economically deprived

communities in which Black people are disproportionately represented (Wills et al., 2025). The rapid digitalisation of primary care services, even though has shown many good benefits, could have negative impact in replicating and potentially exacerbating barriers to accessing these services among minoritised ethnic communities, such as Black people in England (Islam et al., 2024). Moreover, concerns about complexity of the digital interface and data privacy remains a dilemma as Sannon and Forte (2022) suggested that marginalised people such as Black people in England, who have experience historical discriminations and marginalisation in mainstream institutions, tend to perceive more disproportionate harm should their privacy be violated. This could therefore be a deterrent for many individuals from the Black community from using contemporary health apps.

The digital divide affecting Black communities in England operates at various levels. Despite a persistent gap in basic access to digital services, Chidambaram et al. (2024) suggested a more worrying concern over disparities in digital accuracy. Their evidence suggested a significant chance of up to 34% error in the IBM facial recognition for Black people. Such evidence points to possibility of not including Black people in the design of such digital technologies as seen in other healthcare intervention discussed earlier. This could potentially raise concerns over trust and challenge the already existing data privacy and security concerns further, which reflect the historical experiences of excluding Black people in the design of vital interventions (Browne, 2015).

Economic factors could further challenge digital inclusion of Black communities in England. Platt and Warwick (2020) highlighted that Black communities are specifically at more disproportionate economic disadvantage when compared to other ethnicities, and this could have a negative impact on their ability to meet the cost of ongoing digital

upgrades, data, and even smartphone maintenance. Li et al. (2023), a study done in the USA suggested that Black and Minority ethic groups are more likely to experience limited broadband access due their geographical location. This data could also reflect the reality in the England as evidence has shown that Black people are more likely to live in areas of high depravation (Patel et al., 2020), which is often overcrowded, and Evans (2023) highlighted overcrowding as one of the main factors interfering with broadband connectivity. Not having access to a stable broadband connectivity could further impede effective use of mobile health app.

1.7.3 Smartphone Apps for Culturally Appropriate Health Interventions

The literature search conducted in this section was purposive and guided by the specific aim of establishing an evidence base to justify the proposed feasibility study. Search was conducted across Google Scholar, PubMed/MEDLINE, PsychINFO, and the BCU library database, using terms related to smartphone health app, feasibility, cultural appropriateness, and Black and ethnic minority populations. Rather than a formal systematic or narrative review, this approach of identifying existing evidence on acceptability, demand, and implementation is consistent with what Bowen et al. (2009) describe as necessary before designing a feasibility study.

The widespread usage makes smartphone apps a choice for delivering culturally appropriate health interventions for diverse populations. As many as 75% of people aged 44 and younger and more than half of those aged 65 and over in the UK were found willing to use health apps (Chowdhury et al., 2023). There is substantial evidence suggesting that smartphone apps are feasible medium for health promotion for Black people in England. According to Boyle and Barber (2024) 95% of the British population own a smartphone device and this percentage is even higher in those aged 16 to 54, averaging 98-99%. They also suggested that smartphone ownership for

those above 65 was about 82%. However, up to the time of writing this thesis, no evidence was found on how many Black people in England owned a smartphone. Boyle and Barber (2024) suggested a high smartphone ownership generally but failed to stratify the data by ethnicity.

Deng et al. (2024) looked at acceptance and continued usage of health-related smartphone apps in ethnic minority regions in Southwest China. Their findings suggested that ethnic minority groups are not inherently resistant to the use of smartphone apps for health-related inventions. Instead, their continued use of health apps depended on whether the apps fulfilled their expectations and provided the right quality of information. This suggests that both feasibility of the health app and the expectations of the intended audience should be considered when designing a health promotion app for ethnic minority groups.

Ayana is a mental health app that was designed to link Black people in the 'marginalised' communities in USA to therapists of their ethnicity, sexuality and lived experiences. This app was launched in March 2020, and until the writing of this thesis, no review was available to assess its acceptability and effectiveness (Ayanatherapy.com). However, Lee et al. (2020), examined the feasibility of using an app to help young Black women make sexual and reproductive health decisions. This study recruited women aged 15 to 25 and used an app that featured Black women discussing their experiences using contraception. Findings from this study suggested that an app was feasible for health interventions and could augment knowledge and understanding of key health information for minority populations. Moreover, a randomised control trial demonstrated that a mobile phone app specifically designed for African American Women could potentially increase physical activity in this population (Zhang and Jemmott III, 2019). In addition, a feasibility study on the use of

mobile phone app to promote breast cancer screening among Korean Americans in USA revealed that an app was feasible, acceptable, and effective for this purpose (Lee et al., 2018). This study proved that a culturally appropriate app could improve understanding of a desired health intervention and reduce the perceived barriers linked to non-engagement with such interventions.

Even though there is strong evidence suggesting that an app for health promotion for Black people in England could be feasible, there are substantial barriers that need to be considered and further explored. Stiles-Shields et al (2017) revealed common barriers in a US population. These included concerns over the effectiveness of interventions offered through the app, privacy, price of the app, lack of support and feedback, and the functionality of the app. These barriers need to be explored and dealt within the context of the Black communities in England. Moreover, concerns over privacy and security of personal information were also documented in Canada, even though a health app was found to be convenient and had improved access to vital information (Burgess et al., 2016). Barriers found in other countries and cultures may not extend to the Black community in England. British are reserved and tend not to share their opinions and feelings when compared to the Americans (Still, 2018). It is therefore necessary to conduct a feasibility study as a first step in designing a culturally appropriate health promotion app for Black people in England. It is also necessary to understand Black people's perceptions of what a culturally appropriate app should look like, including the facilitators and barriers to its successful implementation (Bowen et al., 2010). Such understanding is necessary to design an app that will not only be culturally appropriate for Black people in England but will keep engaging the users and fulfil their expectations. Bowen et al. (2010) described feasibility study is an ideal way of achieving this, as it is a way of assessing and determining whether an intervention

will be fit for purpose or not. They suggested several situations where a feasibility study might be indicated. Among these are: where an intervention requires partnership with a specific community to be established, where the population of interest require special consideration, or where previous interventions that use similar approaches were unsuccessful. These, among other elements, indicate that the conduction of a feasibility study as a first step in designing a culturally appropriate health promotion app for Black people in England is a necessity.

1.8 Definition of Feasibility Study

A feasibility study is described as a way of assessing and determining whether an intervention will be fit for purpose or not (Bowen et al., 2009). A feasibility study could be necessitated by several factors and according to Bowen et al. (2009), one of such reasons is the need for building and maintaining partnership with the community. Partnership building and community empowerment are vital for designing a culturally appropriate app for Black people in England. Health apps designed with little or no expected user participation run the risk of not being culturally fit for purpose and therefore attract a low uptake (Ruse et al., 2025). This makes a feasibility study an important first step in the design and creation of a culturally appropriate health promotion app for Black people in England. It involves consulting the Black community on the acceptability, demand, and implementation of the app, before moving on with the design of the actual app. There are eight areas a feasibility study could focus on: acceptability, demand, implementation, practicality, adaptation, integration, expansion, and limited-efficacy testing (Bowen et al., 2009). Not all these areas are appropriate for every study. The focus of this study was to understand whether an app was suitable for health promotion for Black people in the England or not. Therefore, the focus was to understand the first three feasibility areas as outlined below:

- Acceptability, which will focussed on understanding how Black people in England will react to the proposed smartphone app.
- Demand, which concerns the projected use of the proposed app in the Black community. This assessed whether community felt such app was needed or not.
- Implementation, which focused on understanding the scope and likelihood that the app could be delivered.

Examining these areas of the feasibility of the proposed app provides a unique opportunity of measuring how likely the proposed app will be acceptable and perceived as useful to the Black community. It also gives the researcher an insight into what implementation aspects might require special attention and as well an opportunity to explore more on what might work for the Black community if an app is not feasible. It was therefore ideal and necessary to conduct a feasibility study as a first step in designing a culturally appropriate health promotion app for Black people in England.

1.9 Theoretical Framework for Culturally Appropriate App for Health Promotion: A User-centred Design and Participatory Research Approach

Health promotion interventions that are based on social and behavioural science theories are more likely to be effective and successful than those that are not (Glanz and Bishop, 2010). Therefore, the design and creation of a culturally appropriate health promotion app for Black people in England will benefit from a strong theoretical backing. The Beattie (1991) model could be used as a theoretical framework to inform four different approaches to designing a health promotion app for Black people in England. The model (see figure 1 below) has four paradigms which are distinguished by either the level of power which could be expert led and a top-down approach focussing either on individuals or the community at large; or a client centred approach which is a bottom-up approach usually negotiated and either focussing on individuals

or a community. Each of these four approaches to health promotion carries a merit. However, most of the smartphone health apps in the mainstream market have followed a top-down approach where the apps are designed, created, and offered to the users without due consultations (Lee et al., 2024). Such authoritarian approach has shown ineffectiveness in representing the needs and expectations of minority populations and seldom being culturally considerate and appropriate (McCurdie et al., 2012). There is a need for focussing on community development which according to Beattie's (1991) model is a negotiated approach that focuses on empowering communities and enhancing their skills, allowing them to be part of the intervention rather than presenting them with the intervention. This is the preferred approach for a culturally appropriate health promotion app for Black people in England as it focusses on interventions that empower and enhance the knowledge, understanding, and skills of groups or local communities rather than individuals (Naidoo and Wills, 2007). In this paradigm, communities identify their own health need, seek empowerment, and make rational choices about their health (Beattie, 1991). The approach also aligns with participatory approach and user-centred design principles (see Figure 4) which could build trust and ownership (McCurdie et al., 2012). It also allows the community to be part of interventions at their earliest stages, providing a unique opportunity of moulding the unique attributes of the community to the interventions, which turn could strengthen ownership and acceptance (McCurdie et al., 2012).

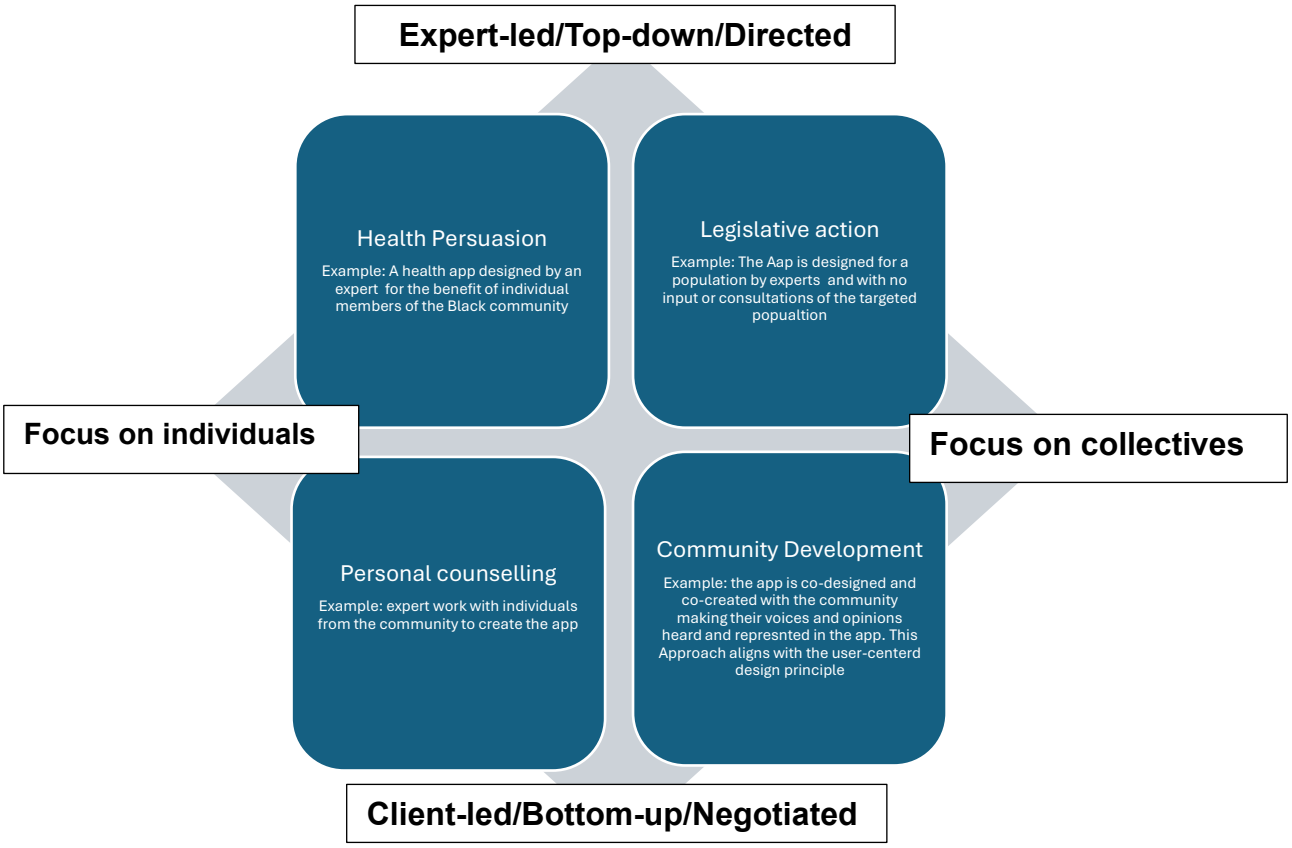

Figure 1: The Four Theoretical Approaches a Health Promotion App Could Take

Note: The Focus in this PhD Thesis is the Community Development Paradigm. Image Recreated and Adopted from the Beattie's Model of Health Promotion (1991)

Involving Black communities in the design and creation of the health promotion app is rooted not only in the concept of community development as discussed in Beattie's (1991) model of health promotion, but also in the Health Belief Model (HBM) which is derived from the Subjective Expected Utility Theory (Edwards, 1954). It postulates behaviour as the outcome of an individual's evaluation of cost and benefit of the behaviour (Janz and Becker.,1984).

Several behavioural change models were considered before selecting the Health Belief Model as the theoretical framework underpinning the design of the proposed health app. These included the Information Deficit Model, the Theory of Reasoned Action, the Theory of Planned Behaviour, the Transtheoretical Model of Change, and

the COM-B model and Behaviour Change Wheel. Each of these was evaluated against the specific requirement of designing a culturally appropriate health promotion app for Black people in England. The Information Deficit Model was rejected early, as it assumes that providing information alone, is sufficient to change behaviour (Dickson, 2005). This model did not account the for cultural, psychological, or structural barriers, which are central to the health inequalities experienced by Black communities in England. The Theory of Reasoned Action and Theory of Planned Behaviour were also considered but both assume that behavioural intention is the primary driver of action, and that individuals have the opportunity and resources to act on their intentions (Madden et al., 1992). These models do not account for the environmental or economic factors that may influence a person's intention, and they assume behaviour results from a linear decision-making process. For Black communities in England, where structural and systemic barriers as highlighted in Marmot (2005) and Marmot (2020), are well documented, these models were considered too limiting. The Transtheoretical Model was considered, but its stage-based approach, which moves individuals through pre-contemplation, preparation, action, and maintenance, (Velicer et al., 1998) is better suited to evaluating behaviour change over time rather than informing the initial design of an app at its feasibility stage.

The COM-B model and Behaviour Change Wheel were examined with strong consideration as the COM-B framework position capability, opportunity, and motivation as the three essential conditions for behaviour change (Michie et al., 2011). These conditions for behaviour change constitute the hub of the Behaviour Change Wheel around which nine intervention functions are positioned (Michie et al., 2011). Even though this is a comprehensive framework well suited to intervention development at a policy level or implementation level, its broad system level focus makes it less directly

transferable into the specific content and design constructs of a health promotion app. It does not, for example, provide direct guidance on how to design app features around an individual's perceived susceptibility to health conditions, their perceived barriers to seeking help, or the use of prompts to trigger health seeking behaviour, all of which are critical to the proposed app's design.

The Health Belief Model was ultimately selected as the most appropriate theoretical framework for this research on the basis of key considerations. First, the HBM was originally developed to explain why individuals fail to engage with preventive health behaviours, focusing specifically on how perceptions of health threat, susceptibility, severity and the cost and benefits of action interact to determine health- related behaviour (Janz and Becker, 1984). This foundational purpose aligns with the central challenge of this research, part of which was to explore what would motivate or prevent Black people in England from downloading and engaging with a health promotion app. In addition, the HBM has an established evidence base for use with Black people. It has been applied to the development of an app that promotes HIV testing in a Black African population in the UK (Evans et al., 2016). It has also proven effective when used as a conceptual framework informing health related interventions. Mohebbi et al. (2019), a randomised controlled trial, explored at the use of the Health Belief Model in developing a theory-based health intervention for women diagnosed with gestational diabetes. This study showed a significant improvement in the perceived severity, barriers, benefits and more importantly the self-efficacy of those in the intervention arm as compared to the control group. The outcome also showed a significant improvement in the self-management of diabetes. In another study, Pipatpiboon et al. (2024) examined the feasibility of using the model as a conceptual framework for designing a health educational intervention, and their study did not only demonstrate a feasibility

of using the model, but it also justified its effectiveness in behavioural change, if the intervention is designed with and for a specific population.

The Health Belief Model has six constructs as seen in figure 3 and these could help provide an understanding of what is needed to change health behaviour (Janz and Becker.,1984), which is integral to designing, creating, and implementing a culturally appropriate app. These six constructs of the Health Belief Model will therefore serve as theoretical framework for designing and the proposed app. These (figure 3) are *perceived susceptibility* which is a perception of how likely someone could be affected by a condition; *perceived severity*, which concerns the perception of seriousness contracting a condition; *perceived threat*, which is a combination believing in ones susceptibility for a condition and a belief that the condition is severe; the *perceived benefits*, which is a perception of the usefulness of an action to reduce threat or the perception of an action in yielding positive values; *perceived barriers*, which is a perception of barriers that hinders taking positive actions, which could be fear of consequences of taking what is believed to be positive action; *cues to action,* which could be either internal or external factors that could facilitate action towards the desired behaviour; and *self-efficacy* which a perception that one has the ability and confidence to perform a desired behaviour. Exploring these constructs in relation to proposed health app will inform the perceived uptake of the app and could help capture the key design concepts, contents and principles that could foster engagement, benefit, and ownership of the app.

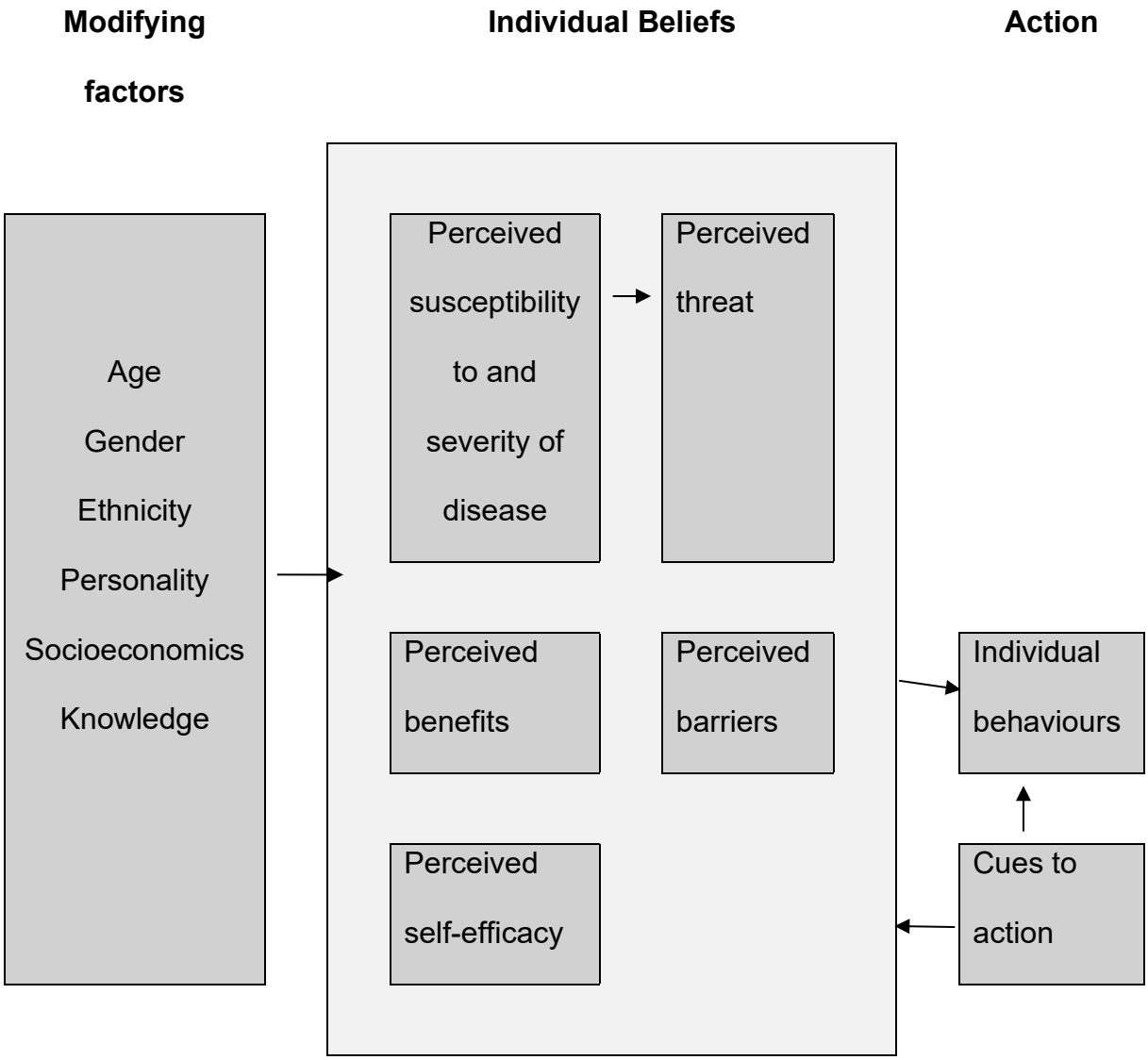

Figure 2:Components of the Health Belief Model. Adopted from Glanz et al. (2015)

The six constructs of the HBM each map directly onto a discrete and actionable line of enquiry in the focus group interview schedule used in the second study of this PhD. They were used to structure specific questions exploring barrier and facilitators to app use, motivation to download the app, and the acceptability of specific design features, providing a theoretically coherent and operationally practical framework for data collection that no other model reviewed could offer at the same level of specificity. Although it was acknowledged that the HBM has limitations, which include its predominant focus on individual cognition and its limited account of the structural and

systemic determinants of health behaviour, these limitations were deliberately mitigated within this thesis by adopting a combined theoretical framework. The HBM was used alongside Beatties's (1991) community development paradigm, which focuses on community empowerment and structural considerations; and the user-centred design framework (see Figure 4) proposed by McCurdie at al. (2012), which ensures that community voices and lived experiences shape the intervention design throughout. Together, these three frameworks provided robust and mutually reinforcing theoretic foundation that addresses both the individual perceptual dimensions of health behaviour and the cultural, structural, and community level factors that are central to developing a health promotion app that is genuinely appropriate for Black people in England.

Beattie's (1991) community development paradigm and the Health Belief Model both resonate with the user-centred design approach, which prioritises individual and community empowerment through active participation in the design process (Saparamadu et al, 2020). Although user-centred design (see Figure 4) can involve users at any stage, such as formative research through to design, implementation, and evaluation, its effectiveness depends on the timing of stakeholder engagement, management of population heterogeneity, and the adaptation of methods to end users (Bartlett et al., 2021; Cornet et al., 2020). To mitigate these risks McCurdie et al. (2012) recommended continuous user involvement throughout the design process, providing a framework that begins with concept generation and ideation, which could be achieved through focus group discussions, surveys, ethnography, and iterative refinement based on user feedback (see figure 4). This thesis adopts the initial stage of this framework, using survey questionnaire and focus group discussions to assess and explore the feasibility of the app and capture the needs, expectations, and cultural

context of Black people in England. The findings will be translated into functional requirements and design guidelines for a culturally appropriate health promotion app, constituting the final output of this PhD. The Health Belief Model constructs will be systematically explored in relation to the proposed app's design (see Table 1).

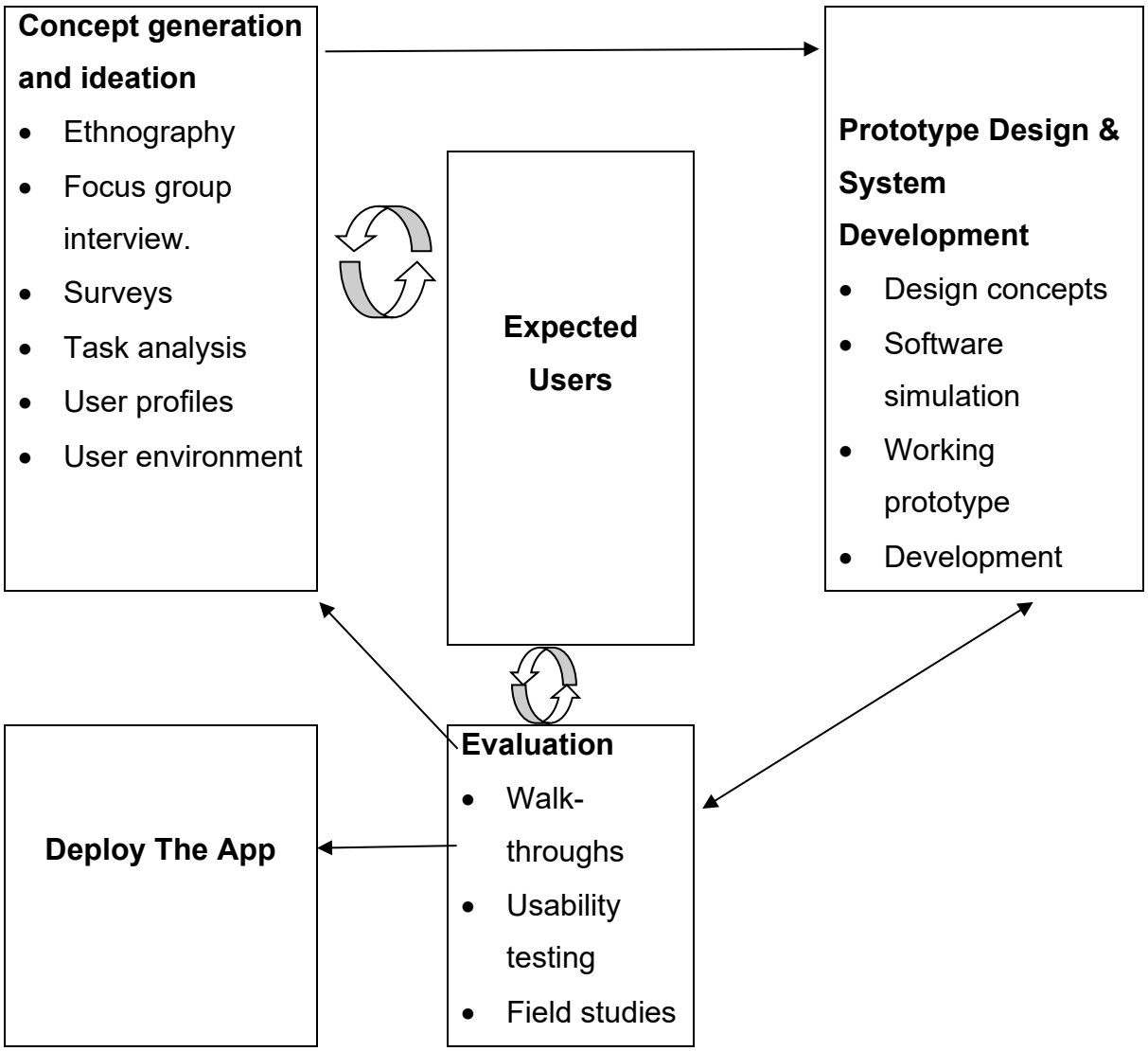

Figure 3: User-centred Design Framework for Designing a Culturally Appropriate Health Promotion App for Black People in England. Adopted from McCurdy et al., (2012)

Table 1: HBM for Designing a Culturally Appropriate Smartphone App

Construct	To Capture the Construct in App Design Concept
Perceived Susceptibility	Explore perception on the proposed app providing information on specific health conditions that Black people might be more susceptible to and the impact this may have on taking actions.
Perceived Severity	Explore perception on whether the app's providing information on the seriousness of a health condition and the influence this may have on a health seeking behaviour or not.
Perceived Benefits	To influence perception about recommended health actions, the app design should explore holistic health benefits that might be meaningful to capture in the app.
Perceived Barriers	To explore the barriers of both using the app for health promotion and behavioural change, the design should include a feasibility study to explore these perceived barriers and address them in the app
Cue to Action	The design should explore the acceptability and perceived impacts of using prompts to impact behaviour initiation.
Self-efficacy	The design should explore feasibility of using an app for health promotion as a first step and also explore the factors that could synergise confidence in both using the app and performing a health-related behaviour.

1.10 Rationale and Significance of a Health Promotion App for Black People in England

The Black communities in England are not monolithic. They represent a diverse, heterogeneous population that experience systemic racism manifested in part through health inequalities. The sections above discussed these inequalities including the digital exclusion that limits Black people's access to health information and services in an era of increasingly digitalised healthcare systems. The decision to adopt 'Black' as

the population grouping for this study is rooted in the principes of inclusivity, accessibility, and the pragmatic realities of health promotion at a scale. While the academic literature has rightly critiqued broad ethnic categorisations for obscuring important within-group difference (Kader et al., 2022; Kauh et al., 2021; Lu et al., 2026), the context of health promotion intervention research demands a logic in which the usability of a tool must take precedence over the granularity (McCurdy et al., 2012) which might be more appropriate in the epidemiological or policy research. Black people in England, regardless of their national origin share a disproportionate burden of poor health outcomes across multiple domains, including higher risk of hypertension, type 2 diabetes, stroke, and poor mental health outcomes (NHS Race and Observatory, 2021). These inequalities are deepened by structural factors such as systemic racism, socioeconomic deprivation, and barriers to healthcare access that cut across national and linguistic subgroups boundaries. A health promotion app designed to address these shared structural determinants therefore has legitimate grounds to speak to the broader 'Black' population.

It is acknowledged that 'Black' as a category encompasses considerable internal diversity. Mitton (2011), for instance, demonstrated that Black Africans in England speak over 250 different languages at home and that integration outcomes vary substantially between communities, such as, the Somali, Nigerian, and Zimbabwean communities. This diversity is relevant to policy, however, this PhD research was not aimed at disintegrating health outcomes by ethnolinguistic subgroup, but rather to inform the development of a health promotion tool that is accessible to as wide a cross-section of the Black population as possible. Designing for a narrower sub-group would risk producing an intervention that excludes the very community it seeks to serve.

Moreover, narrowing the population to a specific sub-group would limit the generalisability of findings and reduce potential public health impact of the intervention. The preceding sections discussed the significant potentials mobile phone health apps have addressing these inequalities, but only if they are genuinely appropriate to the distinct cultural values, health priorities, and the technology preference of Black people in England. The development of a culturally appropriate health promotion app for Black people in England is severely constrained by intertwined and mutually reinforcing problems that collectively represent a fundamental cultural exclusion crisis: inadequate methodological approaches, and epistemic injustice within the contemporary digital health research and development. These are problems that synergise each other, contribute to widening the inequalities that already exist, and disproportionately isolate Black people in England from accessing the needed health related resources that could be otherwise digitally accessed.

Developing a health promotion app for Black people in England is grounded and supported by a converging theoretical, practical, and empirical considerations. Digital apps have proven effective in reducing health inequalities affecting minority ethnic groups, although caution must be taken as it could as well widen an already existing inequality gap or even create new challenges, if appropriate measures such as cultural appropriateness is not addressed (Wadhawan et al., 2023). Furthermore, the round-the-clock availability of a health promotion app could reduce key barriers to health service access for Black people in England, including limited access to culturally sensitive content and the absence of a private environment in which to seek health information. The Black community in England as discussed earlier, is a diverse community with variable needs and capability. Patrick et al. (2021) suggested that the personalisation and customisation capabilities that could be incorporated in mobile

apps could make the proposed health promotion app a great tool for bridging the diversity gap within and around the Black community. Moreover, the app could be instrumental in keeping up with the traditions known to the Black community such as storytelling, visual and performing arts, and other forms of cultural heritage held high by the Black community.

The focus on Black people specifically for a health promotion app is both a reflection of the urgent need for addressing health inequalities experienced by the community, and an opportunity to create a culturally appropriate public health intervention that adds on to the Black community's assets and knowledge systems. The NHS Race and Health Observatory (2024) report is testimony to the urgent need for more creative and culturally appropriate interventions that could address the widened gap of inequality and create cohesive community that is resourced and resilient to the challenges common to its individual members.

The design and creation of the proposed health promotion app employs community-based participatory research which offers a unique opportunity of incorporating culturally appropriate measures such as working with and including communities in the designing and implementing health related interventions. This could address some of factors responsible for the inequalities affecting the Black community (Rodriguez Espinosa and Verney, 2020). This approach could empower the Black community in taking active roles and working with researchers and health service providers in addressing issues to the community.

1.10.1 Academic and Scholarly Contribution with Potential Impact on Policy Direction

This PhD work establishes evidence for culturally appropriate digital health interventions for Black communities in England. The limited availability of evidence-based culturally appropriate digital health interventions within the Black community in

England as highlighted in the NHS Race and Health Observatory (2024), means that the proposed health promotion app could stand out in leading a multi-disciplinary approach to health equity, social justice, and culturally sensitive technology designs. The design and creation of the app could potentiate investment into digital health equity, while prioritising cultural sensitivity through community empowerment and partnership. The NHS England's framework for inclusive digital healthcare placed special emphasis on equal access to digital healthcare and the importance of tackling digital exclusion which affects communities socially excluded.

1.10.2 Cultural Relevance Deficit in Mobile Health Apps

The mainstream mobile health apps demonstrate widespread and systemic lack of cultural sensitivity that may render them inaccessible and unsuitable for Black people in England. The NHS Health App for example has more than 39 million registered users and offers vital services such as repeat prescription, accessing GP health records and GP appointments (NHS England, 2025), yet there is no clear indication of how many Black people have access to this app, nor is there any form culturally tailored health education for health concerns such as hypertension, and diabetes which are all relevant health concerns in the Black community. This deficit in cultural appropriateness goes beyond a mere lack of representation but also include a deeper epistemological exclusion which benefit the Western Individualistic approach to health while ignoring the Indigenous knowledge systems and community-centred holistic approaches to health, which are deeply rooted in the Black community (NHS Race and Health Observatory, 2024). The result of this exclusion is a presumption of designing and commissioning universally accessible health app into the mainstream health market, as seen in the contemporary health app, which in really reinforce the existing

challenges of healthcare and services exclusion experienced by the Black community in England.

In addition, the NHS Race and Health Observatory (2024) report underpins the lack of access to ethnically disaggregated data when the digital and app teams design and commission health apps. This institutional limitation reflects a lack of consideration for racial equity and cultural sensitivity for Black communities in England when vital services are being designed and commissioned.

Even when cultural appropriateness was claimed in the contemporary health apps, there is a risk of claiming blanket cultural appropriateness which might not be suitable for Black people. In their systematic review, Naderbagi et al. (2024) revealed that most apps that claim a blanket cultural sensitivity failed to adopt culture and context consistently and adequately in their design, development, and implementation processes. Where representation of Black people exists within mainstream health apps, it is often tokenistic rather than holistic, failing to reflect the diversity and lived experiences of the community. Such inadequate representation not only undermines Black people's access to culturally appropriate health promotion but risks perpetuating health inequalities by falsely claiming cultural inclusivity.

Another challenge facing Black people in England is geographical concentration of health-related apps for Black people, with most apps developed and commissioned in USA. A notable example is the MobileMen app which was recently developed with and commissioned for trial with African American Black men (Nuss et al., 2025). Such intervention could have a high potential for relatability and acceptance for a specific American population as the app was developed with and for the intended American users, which might not be generalisable to the Black community in England. Moreover, the effectiveness of having health apps culturally tailored to a specific community

cannot be overemphasised. Watson-Singleton and Pennefather (2024), in their RCT examined the effectiveness of a mindfulness app that was co-created with and piloted with African Americans. The outcome of this study showed a high level of satisfaction with the app and demonstrated high level of positive health impact on participants. This reflects an urgent need for a culturally appropriate health promotion app that is designed with and tailored to the needs of Black people in England.

1.11 The Overall Research Aims

1. To assess the feasibility of a culturally appropriate health promotion app for Black people in England focusing on demand, acceptance, and implementation.
2. To identify and explore the barriers and enablers of health app use in the Black community in England, determining interest in a culturally appropriate health promotion app.
3. To explore a design framework to guide understanding and development of a culturally appropriate pp for Black people in England.

1.12 The Research Objectives

1.13.1 Objectives for Study 1: Quantitative Research

1. To determine the determine the feasibility of a culturally appropriate health promotion app for Black people in England, examining its demand, acceptance, and implementation.
2. To examine the relationship between self-perceived health status and health app download and use.

1.13.2 Objectives for Study 2: Qualitative Research

1. To explore the perceived benefits, barriers, and motivation for downloading and using a culturally appropriate health promotion app for Black people in England, using the Health Belief Model as a theoretical framework.

2. To examine and explore design preferences for a culturally appropriate health promotion app for Black people in England.
3. To develop recommendations for the development, design, and implementation of a culturally appropriate health promotion app for Black people in England.

CHAPTER TWO

Overarching Methodology

2.0 Overview of The Chapter

The chapter presents the methodological framework used to investigate the feasibility and design of a culturally appropriate smartphone app for health promotion for Black people in England. This PhD research used a two-phase explanatory sequential mixed-methods design, which according to Plano Clark (2016) uses a quantitative method followed by a qualitative method to address questions such as '*what and why or who and how*' and it is ideal for exploring and describing culturally situated meanings. Therefore, a first step in this PhD research was to determine whether an app was feasible for health promotion for Black people in England, using a survey questionnaire. Establishing feasibility is important in terms of health interventions as it helps evaluate practical considerations including participant recruitment capacity, intervention acceptability, resource requirement, and potential barriers to implementation (Bowen et al., 2009). The two-phase sequential mixed-methods design determined that there would be a qualitative phase that followed the quantitative phase. The findings of the feasibility study determined what questions would be most relevant to ask in the focus-group discussions. This approach helped generate comprehensive evidence that culminates in evidence-based design principles for a culturally appropriate health promotion app. This chapter provides detailed description of the overall research design rationale, outlining the overall research approach and philosophical positioning adopted across the thesis. It is important to note that the chapter does not detail the specific methodology for each individual study. Instead, the methodology for Study 1 and Study 2 is presented separately in chapters 3 and 5 where participants recruitment strategy, data collection,

and analytical approaches are discussed in the context of each study's aims and objectives.

2.1 Overarching Research Design and Rationale

2.1.1 Explanatory Sequential Mixed-Methods Design

This PhD research employed explanatory sequential mixed-methods research. The book, Designing and Conducting Mixed Methods Research by Creswell and Plano Clark (2018) was used as a guide to inform the basis upon which this method was chosen for this research, and this will be discussed in the upcoming paragraphs. There are several definitions for mixed-methods research as cited in their book, but for the purpose of this PhD work the following definition will be adopted: "*Mixed-methods research is the type of research in which a researcher or team of researchers combines elements of quantitative and qualitative research approaches*" (Creswell and Plano Clark, 2018 p.3). They suggested that such research method, has the advantage of providing more evidence than any of quantitative and qualitative methods used alone, as it relieves the researcher of the restrictions associated with each of the two methods when conducted alone, such as quantitative methods not being ideal for exploring meanings and context, while qualitative methods not being the best for exploring cause and effect. A mixed methods approach therefore provides a unique opportunity to answer research questions that cannot be answered by only one method, thus providing quantifiable data and giving it qualitative meaning and context (Creswell and Plano Clark, 2018). This made it a great choice to explore the feasibility of an app for health promotion for Black people in England, which could be achieved through conducting a quantitative research; and for exploring the aspects of the app that could make it culturally appropriate to the Black community in England by conducting a qualitative research study.

Creswell and Plano Clark (2018) suggested that a mixed method could take one of three approaches: A convergent design would generally apply a quantitative and qualitative methods concurrently and would usually give each of the two methods an equal priority. Here, the two results are compared for validation of a set of findings or to ascertain if participants' responses to quantitative questions differ from when open-ended qualitative questions are used to ask similar questions. This method was not ideal for this PhD research for reasons to be discussed in the upcoming paragraph. Exploratory sequential mixed methods is another approach to conducting mixed methods research, and according to Creswell and Plano Clark (2018), it starts with a qualitative study to build the basis upon which the design of a quantitative component relies on. The emphasis here is more on the qualitative part, which ultimately paves the route subsequent quantitative research may take.

This PhD adopts the explanatory sequential mixed methods approach which takes two distinct but interactive phases (Creswell and Plano Clark, 2018). It starts with conducting a quantitative study to answer a specific aspect of a research question as a first phase, which then determines the route a second phase of conducting a qualitative research study to explain or expand the findings from the first phase may take (Creswell and Plano, 2018). The priority here is on the quantitative study, but a qualitative one is needed for explaining the meaning of its findings. This therefore made explanatory sequential mixed methods the right approach for this PhD research. The researcher first needed to establish whether the proposed health promotion app was feasible for the Black community in England first. This necessitated the assessment of the proposed app's demand, acceptability, and implementation, all of which are among the eight distinct areas a feasibility study can focus on, and these three are best tested by a population-based survey using quantitative methods (Bowen

et al., 2009). A follow up qualitative study was then conducted to explore more on what feasibility aspects were perceived as relevant facilitators and barriers to the proposed health app, and to explore what a culturally appropriate app would look like for the Black community. Qualitative methods was best suited for this second phase as it is "*an iterative process in which improved understanding to the scientific community is achieved by making new significant distinctions resulting from getting closer to the phenomenon studied*" (Aspers and Corte, 2019, p. 155).

2.1.2 Philosophical Positioning: Pragmatism

This PhD research takes a pragmatic philosophical position which *"understands knowing the world as inseparable from agency within it*" (Legg and Hookway, 2008). This is built on the epistemological positioning that knowledge is derived from experiences and actions, making truth to be *'what works'* (Dolan et al., 2022 p.4). The pragmatic philosophical positioning aligns with the ontology adopted in this research, that while objective reality does exist, individuals experience multiple subjective realities shaped by social contexts, precluding any single person from accessing all possible perspectives (Dolan et al., 2022). This positioning is ideal for this mixed-method approach as it prioritises a practical problem-solving approach that focuses on the Black community. Pragmatism offers a unique and clear philosophical stance which goes beyond the divide between positivism and interpretivism and therefore focuses on the practical consequence of research and the importance of the research question over methodological orthodoxy (Creswell and Plano Clark, 2018). Such philosophical positioning is particularly important in addressing real world challenges affecting minority ethnic groups such as the Black people in England, as it places importance on the utilisation and actionability of knowledge over theoretical purity (Kaushik and Walsh, 2019). This aligns well with epistemological pluralism which

according to Miller et al., (2008) provides a great opportunity for an innovative and collaborative research, as it acknowledges and draws upon several ways of knowing, which could yield more successful integrated study.

Moreover, pragmatism postulates that reality is achieved through multiple methods of enquiries which therefore rejects the notion of claiming that a single methodological approach could hold a monopoly on truth or credible knowledge production (Feilzer, 2010). Thus, such epistemological pluralism provides a good justification for using both quantitative survey methods to determine the feasibility of an app for health promotion for Black people in England, and qualitative focus group interviews to explore what could make such app culturally appropriate for Black people in England. This methodological approach therefore recognises that each of the two methods generates different forms of knowledge which are complementary to each other, and this is something pragmatism conceptualises as different tools within a broader methodological repertoire (Creswell and Plano Clark, 2018).

When evaluating knowledge claims, pragmatism places a high value on practical consequences and their application to the real world (Morgan, 2014). Such approach could be exemplified by the "*what works*" and *"what solves the problems"* type of enquiry postulated by Johnson and Onwuegbuzie (2004, p.17), which is fundamental to addressing and improving human circumstances. In this regard, knowledge about feasibility and design of a culturally appropriate health promotion smartphone app is rooted in its usefulness for commissioning culturally appropriate health promotion interventions that could meaningfully address the chronic health inequalities affecting Black people in England. This action-focussed epistemology aligns very well with the PhD's research aim of generating evidence-based design principles that could guide a practical creation of a health promotion app that ensures that the production of

academic knowledge serves the benefit of the Black community in England (Kaushik and Walsh, 2019).

Moreover, pragmatism recognises that knowledge is shaped by context, values, and the purpose for which it was created (Kaushik and Walsh, 2019). This positioning should rather not to be viewed as a position that threatens the validity of knowledge (Shannon-Baker, 2016), but instead as an integral part of responsible scholarship in social sciences, which entails empowering communities to address inequalities.

2.2 Research Designs for Individual Studies

2.2.1 Study 1: A Quantitative Survey on The Feasibility of a Smartphone App for Black People in England

Study 1 employed an online cross-sectional survey design to assess the feasibility of a smartphone app for health promotion for Black people in England. A cross-sectional study design was ideal for this research as it allows for a '*snapshot*' or a one-off data collection from participants of a population of interest at a specific moment (Kesmodel, 2018). Such design is particularly appropriate for a feasibility study as it helps the researchers to determine population characteristics and prevalence of attitudes and behaviours without necessarily conducting a longitudinal study to determine these characteristics, and it could also provide a baseline for further exploration (Setia, 2016). This approach has been used in comparable studies. McCall et al., (2023) employed a self-administered web-based cross-sectional survey to examine attitudes towards mobile health technology among Black American women. They explored the acceptability of using a mobile phone to receive healthcare and their findings demonstrate the suitability of cross-sectional design for assessing feasibility of health apps in Black populations. In addition, Bender et al. (2014) used cross-sectional survey design to examine digital technology ownership and factors predicting health app

downloading among ethnic minority groups. Their findings informed the development of a culturally tailored health app, further supporting the suitability of using cross-sectional survey design in feasibility studies. The cross-sectional design made it possible and easier for the researcher to collect all the required data from a large and diverse population within a manageable timeframe, which minimised worrying about high attrition rate (Maier et al., 2023). In addition, a cross-sectional study design aligns with the pragmatism philosophical positioning adopted in this PhD research as it allowed a capture of current attitudes and circumstances around the use of smartphone health apps within the Black communities in England and whether such was feasible for health promotion. This then informed a next step of exploring what works best for the community (Wang and Cheng, 2020). The participants therefore completed the survey once, and the analysis of such data determined the feasibility of a smartphone app in the community which then lead to study 2 that explored what such app could look like in practice. This approach aligns with the Maier et al., (2023), which recommends conducting a cross-sectional study as part of mixed-method research, as being done in this PhD work.

Although cross-sectional study design was convenient and appropriate for this research, the design is not without limitations. The design runs the risk of selection bias where participants who volunteered to take part may systematically differ from non-participants (Wang and Cheng, 2020). To try and minimise this limitation, the methods of recruitment were diversified and included approaching community networks, use of gatekeepers, and social media recruitments. Despite this limitation, the cross-sectional design provided an appropriate and efficient methodology that addressed the research objective of study 1, which subsequently informed the approach and design used in study 2.

Due to the Covid-19 pandemic and the regulations restricting face to face interaction during phase 1 of the PhD research, an online design was used where the survey questionnaire was hosted on Qualtrics and was accessible to participants online through a QR code or a shared link. Although online research could face changes such as *"self-selection bias, non-response bias or only reaching specific subgroups*" (Man et al., 2021) the diversified recruitment strategy mentioned above was hoped to minimise these risks for biases.

2.2.2 Study 2: A Qualitative Study Exploring the Design of a Culturally Appropriate Health Promotion App for Black People in England

This study explored the ideas, experiences and perceptions of Black people in England on the content, acceptability, demand and implementation of a culturally appropriate health promotion app for Black people in England, incorporating the user-centred design principles (McCurdy et al., 2012) and Beattie's (1991) community development approach to health promotion. A qualitative research method was therefore a preferred choice as it collects data on "*participants' experiences, perceptions, and behaviour*" and as well as answers the *'hows'* and *'whys'* questions (Tenny, Brannan, and Brannan, 2022 p. 1). The perceptions and experiences of Black people in England on past health app uses well as the barriers and facilitators of using health apps in the community, needed to be explored to inform the design of a culturally appropriate health promotion app for the Black community. This was best explored using qualitative study design and not a quantitative one, which is best at quantifying findings as discussed in the earlier section. A focus group interview design was used to collect rich data that ensured the answering of the research question. Focus group interviews enable researchers to identify user needs, preferences, and pain points in early stages of product development, allowing participants to discuss their experiences and prioritise features that are most meaningful to them (Bryman, 2016). This design has

been employed in comparable studies. Ahmed et al. (2024) used a quantitative focus group design with Black African and Caribbean communities in England to explore their experiences and views on digitalised primary care services. They conducted both in-person and online focus groups discussions, and recruited participant through community organisations. Such approach is similar to the one adopted in this PhD research. Clark et al. (2026) conducted focus groups recruiting Black adults in United States through social media and explored preferred app features for a culturally appropriate smoking cessation app and their findings included participants' desire for representation, inclusivity, and trustworthy connections within the app. These findings resonate strongly with the themes explored in this PhD thesis.

Focus group interviews are especially valuable for understanding culturally specific health needs and preferences (Olsen et al., 2019) and this allowed the PhD researcher to explore user preferences for content, appearance, and operational features of the proposed health promotion app, thereby generating insights that directly inform user centred design (McCurdy et al., 2012). The review of literature around app designs as discussed in chapter 1, showed that many of the contemporary health apps in the market were designed and presented to users with little or no input from prospective users. Such evidence calls for a co-production approach which could improve the value of an interventions for both individual members of a community and the society at large (Mulvale and Robert, 2021). Not consulting prospective app users could be problematic as a user-cantered design protocol for health apps calls for the meshing of the needs and understanding of users in the design of a fit for purpose health app (McCurdie et al., 2012). Moreover, focus group discussions were preferred over one-to-one interviews as they facilitated real-time interaction among participants, enabling spontaneous discussion, immediate reactions, and the collective building of ideas that

would not have emerged in individual interviews (Bryman, 2016). Therefore, it was reasonable to conduct a qualitative study using focus group interviews with the Black community in England to explore their views, ideas, and perception of what a culturally appropriate health promotion app should look like.

2.3 Reflexivity

Reflexivity refers to the researcher's awareness of their influence over the research process, and the data produced within a qualitative study (Haynes, 2012; Willig, 2013). An important criterion of qualitative research is the possibility of the researcher shifting from the objective of the study to the subjective experiences and perspectives through reflexivity, where the researcher critically examines their own positionality, assumptions, and influences on the research process and interpretation (Berger, 2015; Parker, 2005). This reflexive practice acknowledges that the researcher is not a neutral, detached observer but rather an active participant whose social location, identities, values, and prior experiences inevitably shape data collection, analysis, and meaning making (Dodgson, 2019).

This therefore meant that I, as the PhD researcher, had influence over the chosen research area and the contextualisation of assumptions drawn from the analysis (Devers, 2000). I approached this research self-identifying as a Black African medical doctor, a public health practitioner, and a PhD researcher in psychology, who moved to England about seven years ago and have developed an understanding of the complexity and diversity of the Black community in England but not to the level of someone who was born and lived in the country. Although my identity as a medical doctor and public health practitioner was known to some participants, all the participants were reminded that this research was taking a bottom-up approach, collecting data on their perception of a culturally appropriate health promotion app for

Black people in England, and therefore, my opinion as the researcher did not count during the data collection phase, despite my position within the Black community.

Moreover, identifying as a Black man might have influenced some participants to take part in the study as I could have been perceived as being part of their community, which might have helped build trust and confidence in me as the researcher. However, I had no direct influence over what they shared during the focus group interviews, and my role was rather that of a facilitator using the interview schedule to guide the discussions. Even though some participants did ask me questions regarding my opinion on some of the issues that were being discussed, this was addressed by reminding the participants of what the research aims and objectives were, and that it was their opportunity to share their opinions and my role was to facilitate the focus group interviews.

2.4 Positionality and What Happened Within the Focus Groups

Positionality refers to the ways in which a researcher's social identity, lived experiences, values, and standpoint shape their relationship to the research, the participants, and the knowledge produced (Bourke, 2014; Holmes, 2020). It is distinct from, though closely related to reflexivity which is an ongoing critical process of self-examination. Positionality acknowledges the fixed and fluid locations from which a researcher enters the field (Bourke, 2014). For this research, my positionality was complex and multi-layered as it simultaneously involved conferring the insider and outsider status in ways that had tangible implications for the dynamics observed within the focus groups. My identity as a Black African man positioned me as a partial insider within the Black community in England, in the sense that participants ad I shared aspects of a racialised experience in a predominantly White society. This shared racial

identity facilitated a degree of openness and trust during the focus group discussions. Participants seemed comfortable discussing sensitive issues relating to health inequalities, cultural barriers, and distrust of mainstream health systems including the contemporary health apps. This is consistent with literature suggesting that racially concordant researcher-participant relationships can support greater willingness to engage with health-related research in ethnic minority communities (Olukiun et al., 2021). However, my position also carried significant outsider dimensions that became apparent during the focus group discussions. As someone who came to the UK about seven years ago, I did not share a lived experience of being born and raised in England as a Black person. This is an experience shaped by a set of historical, social, and cultural dynamics. On several occasions, participants referred to culturally specific experiences and historical encounters with health services in England that reflected a depth of embedded experience that I had not fully lived. This meant that, whilst I was racially positioned as part of the community, my cultural and biological outsider status warranted certain assumptions of shared understanding to be carefully navigated. Consistent with Dwyer and Buckle (2009) 'insider-outsider continuum', my positionality in this research occupied a liminal space between the two. This duality has both advantages and limitations for qualitative research. On one hand, my partial insider status likely contributed to participant openness and willingness to discuss sensitive and personal experiences. On the other hand, my outsider dimensions required me to remain particularly attentive to not projecting assumptions onto participants' accounts, and to resist interpreting data solely through the lens of my own cultural background and experiences a Black African person.

These tensions were actively managed during and after each focus group session. Within focus groups, whenever participants directed questions or assumptions to me

as a shared community member, I consistently redirected the conversation by reminding participants of my only role as a facilitator and reaffirming that the research was concerned with capturing their perspectives and experiences, and not mine. This approach was consistent with the bottom-top, community-centred philosophy underpinning the research design, which drew on Beattie's (1991) community development paradigm and the user-centred design framework of McCurdie et al. (2012). Maintaining this boundary was essential to preserving the integrity of the data collection process and ensuring that participants' voices, rather than my own assumptions, shaped the emerging findings. Moreover, my professional identity as a medical doctor introduced an additional layer of positionality that required active management. The existence of a power differential between a medical professional and community participants can inhibit participants from expressing views that might be perceived as contradicting medical expertise or authority (Liamputtong, 2010). To mitigate this, participants were explicitly informed at the outset of each focus group that their knowledge, lived experiences, and perspectives held equal if not greater value than clinical or academic knowledge in the context of this research. This framing was intended to flatten the perceived hierarchy and create a space in which participants felt empowered to speak freely. Following each focus group session, brief reflective notes were made to document key observations regarding the dynamics of the session. This practice is recognised as a valuable strategy for enhancing the rigour and credibility of qualitative research, as it creates an ongoing record of the researcher's engagement with their own subjectivity throughout the data collection process (Berger, 2015). These reflective notes informed subsequent focus group facilitation, allowing for iterative adjustments to the approach in response to emerging insights about how my positionality was shaping the research process.

2.5 Locating the Remaining Methodology Components

As outlined in this chapter, the methodological framework presented here is intended to provide the overarching context for the research. The specific methodological details for each study are addressed separately, embedded within the chapters devoted to each study. The detailed methodology for Study 1, including the recruitment strategy, data collection procedure, and analytical approach, is presented in Chapter 3. Similarly, the specific methodology for Study 2, covering the qualitative focus groups study participants recruitment, data collection, and framework analysis is found in Chapter 5. Readers are directed to these respective chapters for a full account of how each study was designed and conducted.

CHAPTER THREE

Methodology for Study 1: A Quantitative Survey on The Feasibility of a Smartphone App for Black People in England

3.0 Overview of the Chapter

This chapter presents the detailed methodology for Study 1, which aimed to determine the feasibility of a culturally appropriate health promotion app for Black people in England, examining its demand, acceptance, and implementation, and to examine the relationship between self-perceived health status and health app download and use. The overarching methodological framework underpinning this study, including the explanatory sequential mixed-methods research design, the pragmatic philosophical positioning, and overall study design, has been presented in Chapter 2 and will not be repeated here. This chapter therefore focusses specifically on methodological components unique to Study 1. The chapter begins by describing study participants, inclusion and exclusion criteria used to determined eligibility for this online cross-sectional survey. The sampling strategy adopted for this study is then outlined, providing rationale for the approach taken. This is followed by a description of the survey questionnaire, including its development and structure. The data collection procedure is then detailed. The chapter subsequently presents the data analysis approach, describing the statistical methods employed to address the study objectives. Finally, ethical considerations relevant to this study are discussed, including issues of consent, confidentially, and ethical approval.

3.1 Study Participants, Inclusion, and Exclusion Criteria

The study participants were Black people aged 18 years and above living in England at the time of data collection. This population was defined in line with the Office for

National Statistics (2021) as anyone self-identifying as Black African, Black Caribbean, Other Black including Mixed or Multiple ethnic groups that included Black such as White and Black African, White and Black Caribbean, and Black with any other ethnicity.

Table 2 shows a summary of the inclusion and exclusion criteria employed in the research. To take part in the study, participants needed to fulfil all the criteria listed on the table. Even though the NHS Health Research Authority (2024), recommends that young people from age 16 could give consent on their behalf to take part in research such as the clinical trials, the British Psychological Society (2021), highlighted that the best age for independent consent is 18 as young people below this age are bounded by legal right to safeguarding which will be a duty the researcher must fulfil if they were to recruit participants under 18 years old in a research. Moreover, the participants needed to have the ability to read and understand English language as the questionnaire was administered in English language and there was no access to fundings that could facilitate the inclusion of other languages. They also needed to have capacity and were willing to sign a consent form (Appendix 1.3) before they could take part. Anyone who did not fulfil these criteria was excluded from taking part in the study.

Table 2: The Inclusion and Exclusion Criteria for Study 1

Inclusion criteria	Exclusion criteria	Reason
Self-identify as Black (Black African, Black Caribbean, Other Black including Mixed or Multiple ethnic groups that included Black, such as White and Black African, White and Black Caribbean).	Anyone who did not self-identify as Black or had a Black background	The study focussed on Black people only
Must be aged 18 and above	Anyone below that age of 18	To avoid safeguarding issues that the researcher did not have capacity to handle
Ability to read and understand English language	Anyone who could not read or understand written English.	No access to funding that could facilitate the inclusion of other languages
Capacity and willingness to sign a consent form	Anyone who did not have capacity or was unwilling to consent	To abide by faculty ethics guidelines and research integrity

3.2 Sampling Strategy

The study employed a combined purposive and snowball sampling approach to recruit Black people aged 18 and above living in England to take part in the feasibility study. This sampling strategy, although a non-probability one, was ideal for reaching a marginalised population that is often tagged as *'hard to reach'* (Naderifar and Ghaljaie, 2017), a term that could be used to justify exclusion of minority ethnic groups which impacts the widening the inequality gaps that affects the Black community in almost all aspects including research and health service interventions. According to Palinkas et. Al (2015), purposive sampling involves the deliberate selection of study participants based on their predetermined criteria relevant to the research objectives. It was vital that the responders to the survey questionnaire used in this study were from within the Black community in England, which made purposive sampling strategy an invaluable

instrument in reaching out to the Black community in England. This was made possible through partnership with the Birmingham City Council, Black community networks, Black community activists who served as gatekeepers to their community networks, and Black social media community platforms. These participant recruitment channels were purposively identified and utilised by the researcher based on the higher likelihood of reaching a diverse representation of the population of interest. This strategy therefore ensured that the participants in the survey met the inclusion criteria and also represented a diverse segment of the Black community in England. This diversity included varied age groups, gender identities, and varied geographic locations within England.

The snowball component of the sampling strategy for this study enabled the researcher to request initially recruited participants to help recruit more participants from their acquaintances (Naderifar and Ghaljaie, 2017). The request of existing social networks within the Black community in England to help with access was grounded by Black community's experiences of institutional and other forms or racism as detailed in Chapter 1, which suggested many lose trust in research, which makes recruitment for research challenging (Ting et al., 2025). Snowball sampling therefore helped the researcher to capitalise on the existing trust within the Black community, using referrals from the community members who have taken part in the study.

Integrating purposive and snowball sampling strategies in this research enhanced sample diversity allowing access to participants through multiple channels, rather than relying on a single source that may risk over-representation or under-representation of specific demographic subgroups.

3.3 Sample Size Determination, and Participants Recruitment Strategy

To ensure adequate statistical power to detect significance while avoiding unnecessarily large sample size for this study (Charan and Biswas, 2013) the guidance on Qualtrics, the software that hosted the survey questionnaire, stated that a sample size of least 385 participants was needed for an infinite population. This was a verified software that was accessed through the university subscription. This sample size was also supported by Nnodim et al. (2021) which suggested that such size could give sufficient data to draw assumptions for any population size at 95% confidence level with 5% margin of error.

The effective recruitment of Black communities into health-related research requires a culturally informed approach that addresses the known barriers to participation (Farooqi et al. 2022; Hussain-Gambles et al. 2004). Therefore, this study used several channels designed to reach the diverse segments of the Black community in England, considering the historical context on the mistrust between Black communities and research institutions. This included the use of trusted community organisations and community gatekeepers within the Black community rather than relying on academic channels, to foster trust and willingness to take part (Farooqi et al., 2022). Due to the constant and rapidly changing Covid-19 rules in England at the time of data collection, contact with participants, gatekeepers and community organisation was mainly virtual. The PhD researcher was an Advisory Board Member to the biggest online Black community network in Birmingham, the Black Owned Birmingham network, which had more than 23,000 members and this online resource was a good avenue for recruiting participants. A letter of access (Appendix 1.1) was sent to all community organisations, community networks, and gatekeepers, and it detailed the aim of the research and expectations from participants. Participants were also recruited from community

gatherings whenever the Covid-19 rules allowed, and this included a Black community festival held in London where the research advert with a QR code (Appendix 1.4) was shared. This enabled linked access to the Participant Information Sheet (Appendix 1.2) and consent form (Appendix 1.3), which subsequently lead to the questionnaire if they wanted to take part. The research advert (Appendix 1.4) was also shared and circulated widely on social media networks including WhatsApp, Facebook, and Instagram using a snowball technique.

3.4 The Survey Questionnaire

The questionnaire for the survey was developed adopting Krebs and Duncan (2015) which is a US based population survey that looked at health app use including reasons for using and discontinuing such apps. This was ideal for the feasibility study as it asked questions regarding health app use and non-use, perceptions on the effectiveness of health apps, and reasons for discontinuing health app used. According to Bowen et al. (2009), these are all relevant in assessing and exploring the demand, acceptability, and implementation of an intervention, which are some of the routes a feasibility study could take. This questionnaire was modified using the constructs in the Health Belief Model, which was the theoretical framework upon which this study was based on. The questionnaire was divided into three sections, with the section on demographic data asking questions regarding age, gender, and race/ethnicity. Such demographic data was important to determine any correlation with the other variables regarding feasibility of the proposed app. A section of the questionnaire explored the perceived general wellbeing of participants, in which participants were asked what they considered their wellbeing to be. This was to know explore as Robbins et al. (2017), suggested that people who self-report being in state of good health are more likely to download and use health apps than those who reported a poor health. Five questions

looked at the perceived effectiveness of health apps. These included questions on having ever downloaded an app to track anything related to the participant's health, (see Appendix 1.5) drawing from the HBM constructs, perceived benefits, and perceived barriers. These included questions regarding how many health apps participants used, reasons for use, perceived usefulness of such Apps, and the focus of the apps. There were questions regarding preference of contemporary apps or apps specific to Black people, and as well as a question exploring content preferences in an app for Black people in England. The response format employed several formats which included 5-point Likert scales, multiple choice questions, and open-ended questions to allow elaboration and exploration of some ideas. The complete questionnaire contained 21 items, and it took an average time of 15 minutes to complete.

3.5 Piloting the Questionnaire

Piloting is one of the key methodological components of online survey questionnaires (Lumsden, 2007). It could be done by testing the questionnaire with a small number of participants from the intended study population as defined by Viechtbauer et al. (2015 p. 1375) as a "*small-scaled study that helps examine the practicality and feasibility of the methods to be used in a subsequent larger and more comprehensive investigation"*. It could therefore help in ensuring that the questions being asked in a study are adequate and efficient in addressing the research question. Piloting is useful in keeping a check on whether the content of what is being asked is understood as intended, and whether the technology used is appropriate and feasible for the intended study participants (Regmi et al., 2017). These aspects form part of the validity of the questionnaire, which refers to the accuracy of the questionnaire in measuring what it claims to measure (Jain et al., 2016).

To ensure that the questionnaire used to measure the feasibility of a health promotion app for Black people in England was tested for face validity, piloting was done with 14 participants within the Black community. Using the guidance on Bowden (2002), each participant was therefore asked about what they thought about the questions on survey questionnaire in general, whether any of the questions appeared unfamiliar to them in terms of terminology used or wording, whether the questions followed an acceptable order, whether the response categories were appropriate, whether there were any questions they thought should not be asked, whether there appeared to be a repetition of questions, and any changes they might suggest on the questionnaire. The feedback from the piloting, which was all positive and not necessitating any changes in the questionnaire, was important in ensuring the questionnaire was fit for purpose and aligned with the pragmatic philosophical position adopted in this research which focused on working with the Black community in England to co-design a culturally appropriate health promotion intervention.

3.5.1 Setting Up and Conducting the Pilot Study

The pilot study was conducted entirely online using Qualtrics to host the survey questionnaire and Microsoft Teams for participants feedback on the questionnaire. The decision to conduct the pilot online was driven by two key considerations. First, the aim of the research was to recruit participants from across England, making an in-person pilot logistically impractical. Second, the ongoing restrictions associated with the Covid-19 pandemic at the time of data collection made remote data collection the most appropriate and safe option (Forrestal et al., 2015). Recruitment for the pilot study was carried out through a combination of social media platforms and online community networks. Purposive sampling employed to identify participants who self-identified as Black or had any Black background, aged eighteen and above, and were residents in

England, reflecting the target population of the main study. Posts advertising (Appendix 1.4) the pilot were shared via social media platforms including Facebook and WhatsApp groups used by Black communities in England. Interested individuals were directed to contact the researcher directly if they had any questions or concerns regarding the research or their participation. No concerns were raised and participants were able to view the information sheet (Appendix 1.2) through the links and posts shared with them on the social media platforms. It was until they had acknowledged that they had read and understood the information sheet, had an opportunity to ask questions and have them answered, that they could then access the consent form (Appendix 1.3). In addition, access to the questionnaire (Appendix 1.5) was restricted, unless they had signed the consent form. No challenges with the Qualtrics enabled logics was reported by the participants and access to all the documents went as planned. Participants could only view the documents in this order: information sheet, consent form, questionnaire, and then the participant debrief sheet and thank you note.

Once the participants had taken part in the filling the questionnaire, they were sent a Microsoft Teams meeting invitation to an online session where they shared feedback on their experience using the online questionnaire. Prior to the pilot session, participants were provided with clear guidance on how to access and use Microsoft Teams, including what to do if they encountered any technical difficulties during the session. This was consistent with the recommendations of Willemsen et al. (2022) regarding adequate participant preparation for online data collection. The online session, which was facilitated by the PhD researcher, gave each participant the opportunity to provide structured feedback based on the framework outlined by Bowden (2002). The PhD researcher guided the verbal feedback through each section of the questionnaire, and this was recorded in real time. Following the pilot, a review

of the feedback was carried out to determine whether any amendments to the questionnaire were required before the main data collection phase. As all feedback were positive and no substantive changes were deemed necessary, the questionnaire was confirmed as fit for purpose and the main data collection phase proceeded without amendments. The outcome provided reassurance that the questionnaire was clearly worded, culturally accessible, and technically feasible for the intended study.

3.6 Data Collection Procedure

The survey questionnaire was administered through Qualtrics which was a secured software platform accessed through BCU paid subscription. The platform allowed access via smartphone devices and computers, making the questionnaire easily accessible to anyone who had a smartphone device while maintaining safety in protecting and storing participants data (Rudolph, 2021). Participants were granted access via shared links or by scanning a QR code that enabled them to access to the Participant Information Sheet (Appendix 1.2) via Qualtrics. It was only upon the acknowledgement of reading and understanding this document and being able to ask questions online via email, that they could access to the consent form (Appendix 1.3). Qualtrics allowed the use of branch logic, which allowed respondents to be sent down a different path based on the choice they make from a multiple-choice question. This function was used to make the questionnaire more accessible and avoid showing participants questions that were irrelevant to them based on their responses. It was also valuable in storing the collected data while data collection was still ongoing, which were later exported to SPSS for analysis. Upon completion of the questionnaire, participants were automatically redirected to the Participant Debrief Sheet (Appendix 1.7) which provided more information about the research including signposting to relevant support.

The initial planned data collection period was from June 10th, 2021, to the 2nd of February 2022 following BLSS ethics approval (see Appendix 1.6) but the survey was closed early in October 2021 after reaching the target number of participants.

3.7 Data Analysis

3.7.1 Data Preparation and Management

The data analysis procedure started with importing data from Qualtrics into IBM SPSS Statistics Version 28.0 downloaded and installed using the university licence, with statistical significance set at $p<0.05$ for all inferential tests (Kwak, 2023). Data management was then initiated using the description in Kotronoulas (2023) as a guide. First, the uploaded data was examined for duplication using the IP addresses which were deleted once this process was completed. This was followed by a confirmation check that all participants had signed the consent form (Appendix 1.3), which was a prerequisite logic set up on Qualtrics for accessing and filling the survey questionnaire. None of the respondents bypassed the signing of the consent form as this was set up as a pre-requisite on Qualtrics.

The data was then examined with one of the PhD supervisors and the missing data was addressed using the guidance in Field (2018). First, responses that did not go beyond completing the demographic, which were the first sets of questions at the start of the survey were deleted completed for not contributing to answering the research questions. No threshold was set for using multiple imputation for missing numerical as Madley-Dowd et al. (2019) demonstrated that such widely used practice where researchers keep thresholds at a range of 5% to 40% for missing data is misleading and does not differ from missingness ranging from 1% to 90%. They demonstrated that multiple imputation could produce unbiased estimates regardless of how much data is missing, even up to 90%. Therefore, for those that missed numerical data and

were normally distributed, the mean was used as a replacement for the missing values. The median was used for skewed data while the missing categorical data was replaced with the mode. This approach was chosen because median is preferred over the mean as a measure of central tendency when data are skewed, due to its resistance to the influence of extreme values or outliers (Field, 2018). The variables were examined for entry errors and out of range values, with any identified values investigated and corrected where appropriate. This included making sure the variables label column made sense to the researcher, and that the values column represented the categories they should represent based on the questionnaire items. Also, a check was done to make sure all variables were correctly coded as nominal, ordinal or scale.

3.7.2 Descriptive Statistics

Descriptive statistics provides an opportunity to identify patterns and features that help answer questions such as "*who, what, where, when, and to what extent*" about a population of study (Loeb et al, 2017). Therefore, it was used to identify trends and variations in the study population. The descriptive statistics employed provided comprehensive characterisation of the sample and key study variables, establishing the foundation needed for the subsequent inferential analysis (Cooksey, 2020).

3.7.3 Demographic and Health Characteristics

The participants' demographic characteristics were summarised and presented using frequencies and percentages for the categorical variables including gender, ethnicity subcategory, and perceived wellness. For age, which was a continuous variable, mean, standard deviation, and ranges were used to identify participants characteristics that might influence health app attitudes and usage patterns.

3.7.4 Distribution of the Data

Before conducting any inferential analysis, the distributional properties of the continuous variables were examined to ascertain appropriateness of parametric versus non-parametric statistical tests (Vrbin, 2022). The normality was therefore assessed using histograms and Q-Q plots. Histograms allowed the researcher to visually inspect the distribution of the data and to judge the distribution assumption, and Q-Q plots offered the advantage of more precise identification of the distribution, revealing whether there was deviation in the tails or throughout the distribution (Field, 2018).

3.7.5 Health App Use, Non-use, and Reasons for Discontinuing

Descriptive analysis was used to characterise patterns of health app use and continued use within the sample. The percentage of participants who had ever downloaded health app was calculated, along with frequencies for types of health apps downloaded. Among those who downloaded health apps, the percentage reporting current active use versus discontinued use was determined. For the participants who discontinued health apps use, reasons for discontinuation were summarised using frequencies and percentages across provided categories. These descriptive findings provided essential feasibility indicators regarding current health app engagement patterns and barriers to sustained use.

3.7.6 Inferential Statistics

Inferential analysis was used to examine the relationships between participant characteristics and health app attitudes, usage patterns, and preferences. This generated insights about factors associated with health app adoption and informing understanding of cultural factors influencing health app acceptance.

3.7.6.1 The Association of Gender with Health App Download

Chi-square tests of independence examined whether gender was significantly associated with health app download behaviour (ever downloaded vs never download). Crosstabulation tables presented the distribution of app download status by gender categories, with chi-square statistics, degree of freedom of association, and p-value reported. Where significant associations were identified, post-hoc analysis was used to examine specific gender group differences in downloaded rates. This analysis addressed feasibility considerations regarding whether health app interventions might differentially appeal to or be adopted by different gender groups within the Black community.

3.7.6.2 Relationship between Age and App Download and Use

The relationship between participants age and health app download and usage behaviours was examined to determine whether age represented a significant factor influencing the adoption of a health promotion app for Black people. Prior to running this analysis, the Kolmogorov-Smirnov test assessed the normality of the age distribution. Visual inspection through histograms and Q-Q plots supplemented this formal test, with skewness and kurtosis statistics also examined (Field, 2018). Results indicated that age departed significantly from normal distribution ($p<0.05$), necessitating non-parametric analytical approaches. Spearman's rank order correlation was therefore employed to examine associations between age and app behaviours.

3.7.6.3 Association Between Perceived Wellness and Health App Use, and Relationship Between Having Downloaded and Used Health App and Preference of Having a Black People Focused Health App

The relationship between participants' perceived wellness and health app usage was examined using a chi-square test. Also, chi-square tests of independence examined whether prior health app download and use experience was associated with expressed

preference for a specifically Black people focused health app. Cross-tabulations presented the distribution of preferences for an app specifically for Black people across categories. A similar test was run for the association of 'trust' as a reason for not downloading a health app with preference of having an app specific to Black people in England.

3.7.7 Analysis of Open-ended Question Responses

The open-ended question explored the preferred health app features in a health promotion app for Black people in England. Content analysis was used for the responses from the open-ended questions. It is defined as *"a systematic, replicable technique"* that is used to compress large text into smaller *"content categories based on explicit rules of coding"* (Huckin, 2003; Krippendorff, 1980; and Weber, 1990 cited in Stemler, 2001). It shares some similarities with thematic analysis as they both cut across data searching for patterns and themes. However, their main difference is that content analysis has an added option for the researcher to quantify data which may be helpful in determining the prevalence of some themes highlighting their commonalities and importance to the phenomenon of interest (Vaismoradi et al., 2013). The different types of health apps used by participants were also grouped into themes and reported with the frequencies of each theme.

3.8 Ethical Considerations

The study attained full ethical approval on September 13th, 2021, from BLSS Ethics Committee and was given the reference identifier, Gai/#9316/sub1/Am /2021 /Aug /BLSS FAEC - Feasibility and Design of a Black Health Education/Promotion App (See Appendix 1.6). The research was then conducted strictly adhering to the terms and conditions of this approval and as well as abiding by the UK General Data

Protection Regulation (UK GDPR, 2018), British Psychology Society Code of ethics 2021, and the UK Data Protection Act 2018.

3.8.1 Informed Consent

Kaewkungwal and Adams (2019) suggested that researchers conducting online research could differ in their communication of risk and other issues concerning informed consent and the availability of a contact person for in case there was a deviation in the study. To avoid such risk and in keeping with BLSS ethics approval conditions and the BPS code of ethics, the questionnaire was hosted on Qualtrics which enabled the researcher to use branch logic and piping that ensured that study participants could only access the questionnaire after reading and acknowledging full understanding of the Participant Information Sheet (Appendix 1.2) The participants also needed to acknowledge having had an opportunity to ask questions online via email regarding their participation and that their questions or concerns were satisfactorily addressed before they could access the online questionnaire. The consent form (Appendix 1.3) then required participants to confirm they had read the information sheet (Appendix 1.2) and had the opportunity to ask questions which were answered satisfactorily. They also needed to confirm they were 18 and above and confirm that they understood the personal data such as age, gender, and ethnicity were being collected and to be treated as clearly stated in the information sheet. They were also required to confirm that they understood that their participation was entirely voluntary and that they could withdraw at any time until July 1st, 2021, when data analysis was to begin, without giving reason. To withdraw their data, participants were required to contact the researcher and provide the pseudonym they were instructed to create during data collection. Finally, participants needed to confirm that they agree to take part but also confirming that they understood that their data was anonymous and

was going to be stored in a secure university servers, only to be accessed and used by the researcher and his supervisors for the purpose of the research, but with possibility that the findings from the research would be presented at conferences or published in journal publications. It was only upon confirmation of all these points that participants could access the online questionnaire, otherwise a piping was applied to signpost them to the thank you page with no participation in the research.

3.8.2 Confidentiality and Data Protection

Even though demographic data such as sex, age and ethnicity were collected, participants' anonymity was preserved by activating the 'anonymise response' function on Qualtrics. Switching such function on, guaranteed that the responses from participants were anonymised and therefore protected their confidentiality (Qualtrics, 2022) Moreover, these demographic data are typically collected in feasibility studies (BinDhim et al., 2014; Min et al., 2014). According Bindhim et al. (2014) which was feasibility study that explored smoking cessation app uptake across the UK, Australia, and the United States, collecting demography could help identify patterns as females were more likely to download and use smoking cessation apps than men, and the mean age for the use of such apps was 32 (BinDhim et al., 2014). The findings from their study therefore justified a need to assess if age and sex could affect the feasibility of a culturally appropriate health promotion app for Black people in England.

Participants were asked to provide their emails if they wanted to take part in the second phase of the research. To maintain anonymity and confidentiality while providing their email, participants had to click on a separate link to the questionnaire and the emails provided were stored a BCU password protected OneDrive account, keeping them separated from the data.

The participant consent form (Appendix 1.3) formed part of the data, and because participants could withdraw their data until at a fixed time when data analysis was to be started, they were guided to creating a unique code which they needed to provide to the researcher if they wished to withdraw from the study. This was deleted from the data before the analysis was started, and the entire data was kept anonymised thereafter.

The anonymised data was kept stored in the PhD researcher's BCU password protected OneDrive account. However, the data hosted on Qualtrics was destroyed once the analysis process was completed. The anonymised research data was to be kept in the PhD researcher's BCU OneDrive account for 10 years after the completion of the project in accordance with BCU's policy and will then be permanently deleted thereafter in accordance with the Data Protection Act (2018) and the British Psychology Society (BPS) Code of Human Research Ethics (2021).

CHAPTER FOUR
Results for Study 1

4.0 Overview

This chapter presents finding form study 1 with the objective of determining the feasibility of a culturally appropriate health promotion app for Black people in England, examining its demand, acceptance, and implementation. The study also examined the relationship between self-perceived health status and health app download and use. The rationale for conducting this study is rooted in the health inequalities that disproportionately place Black people in England at disadvantage in many ways as detailed in Chapter 1 but also stemmed in the literature discussed earlier which support a high potential for use of culturally appropriate health apps to address health inequalities. This study contributes to the wider literature by examining the acceptability, demand, and potential implementation of a culturally appropriate health promotion app for Black people in England.

4.1 Demographic and Health Characteristics

A total of 516 people visited the survey page online, and their activities in either partial or complete filling of the questionnaire were recorded as responses. 129 responses were deleted from the data set for being incomplete responses that did not go beyond completing the first set of questions, the demographic data. The remaining 387 completed responses were eligible for data analysis. The mean age of the sample was 30.4 years *(SD 11.5)* and ranged from 18-70 years. Table 3 shows the gender distribution of the respond. In terms of ethnicity, 291 (75.2%) identified as African, 70 (18.1%) as Black Caribbean, and 24 (6.2%) as any other Black, African, or Caribbean background.

Table 3: Self-identified Gender Frequency Table

Self-identified Gender	Frequency	Percentage
Female	247	63.5%
Male	134	34.6%
Non-binary	1	0.3%
Preferred not to say	5	1.3%

Regarding perceived wellness, 242 (62.5%) described their health as either being 'very good' or 'excellent', 106 (27.4%) as average, and 39 (10.1%) as either being of fair or poor health. Table 4 below shows details of the self-reported perceived general health status by ethnicity. Only 8.6% of Black Caribbean respondents reported their health status as being excellent, compared to 20.6% Black African respondents who reported being in excellent general health status. Similarly, Black Caribbean respondents were more than twice as likely (2.9%) to self-report poor health than the Black African respondents (1%).

Table 4: The association of ethnicity/race with perceived general wellness

Ethnicity	Perceived general health status					
	Poor	Fair	Average	V. good	Excellent	Total
African	3 (1.03%)	21 (7.22%)	72 (24.74%)	135 (46.39%)	60 (20.62%)	291
Caribbean	2 (2.86%)	9 (12.86%)	28 (40%)	25 (35.71%)	6 (8.57%)	70
Any other black	0 (0%)	4 (16.67%)	6 (25%)	10 (41.67%)	4 (16.67%)	24
All ethnicities combined	5(1.3%)	34 (8.83%	106(27.53%)	170 (44.16%)	70 (18.18%)	385

4.2 Distribution of Data for Age

The normal distribution and homogeneity test was applied to test whether the data was normally distributed for age. Levene's test of homogeneity of variance (table 5) showed

that the variances were homogenous with level of significance >0.05 (F = 2.339, P = .127).

Table 5: Test of Homogeneity of Variance for Age

		Levene statistic	Dff1	Dff2	Sig
Age	Based on mean	2.339	1	378	.127
	Based on Median	2.449	1	378	.118
	Based on median and with adjusted df	2.449	1	377.680	.118
	Based on trimmed mean	2.592	1	378	.108

4.3 Health App Use Among the Respondents

A total of 212 (54.8%) respondents had downloaded and used an app to track an element of their health in the past. Of the 209 participants who responded to the question on how many health apps they had previously downloaded, most app downloaders 197 (94.3%) downloaded 1-5 apps, while 12 (12/209, 5.7%) downloaded 6 or more apps. The most frequent reasons for downloading and using health apps reported by app users were to track how much physical activity they were getting (158/212, 74.5%). Other reasons were to show or teach them exercise (96/212, 45.3%), to access health information (91/212, 42.9%), to track a health measure (75/212, 35.4%), for weight loss (74/212, 34.9%), and to help watch what they eat (71/212, 33.5%).

Concerning the recommendation for use of a health app, over half of the respondents (231/377, 59.7%) reported never having been recommended to download and use a health app. Of those who had been recommended to use a health app, recommendation was more frequently from friends (110/137, 80.3%), while recommendations from family members constituted about half (62/129, 48.1%). Health apps recommendation from doctors (33/132, 25%) and nurses (20/124, 16.1%) were less frequent.

4.4 Non-use and Reasons for Discontinuing Health Apps

Among the respondents that downloaded and used health apps in the past, 70.9% (146/206) had discontinued a health app they downloaded. Loss of interest (84/145, 57.9%) was the most common reason for discontinuing app use. Other reasons for discontinuing were apps having a hidden cost (29/145, 20%), apps taking too much time to enter data (18/145, 4.7%), and any other reasons (14/145, 3.6%).

45.2% (175/387) of the respondents reported not having ever downloaded any apps to monitor anything related to their health. The most frequent reasons for not downloading an app were not needing an app (84/117, 71.8%), and not trusting apps (84/119, 70.6%). Other reasons were lack of interest for apps (69/102, 67.6%), apps being too costly (48/87, 55%), apps taking too much mobile data (63/120, 52.5%), and apps being too complicated to use (47/109, 43.15%).

4.5 The Association of Gender with Health App Download

Gender was initially recorded in three categories (male, female, and non-binary/other) and with a fourth category for those that did not wish to disclose their gender identity. However, due to the small number of participants in the non-binary category (n = 1), this group was excluded from the chi-square analysis to ensure adequate cell counts and meet the statistical assumptions on the test. The analysis was therefore conducted using only male and female categories. Table 6 shows that the number of females who downloaded and used an app was 149, while the expected count was 134.8, and for males, 59 downloaded and used a health app while the expected count was 73.

Table 6: Crosstabulation of Gender and Health App Download

		Downloaded an App		Total
		Yes	No	
Female	Count	149	98	247
	Expected count	135	112	247
Male	Count	59	75	134
	Expected count	73	61	134

A chi-square test of independence (table 7) was performed to examine the relation between identifying as male or female gender and downloading and using a health app. The relation between these variables was significant $\chi^2(1, N = 381) = 9.3, p = .002$. Those identifying as female gender were more likely to download and use a health app than those that self-identified as males. The decision to exclude the non-binary category of gender from the chi-square analysis was based on its expected cell count being below the minimum threshold of 5, which violates a key assumption of the chi-square test.

Table 7: Chi-Square Test for Association of Gender with Health App Download

Value		df	Asymptotic Significance (2-sided)
Pearson Chi-Square	9.304[a]	1	.002
Likelihood Ratio	9.302	1	.002
Linear-by-Linear association	9.280	1	.002
N of valid cases	381		
Note: 0 cells (.o%) have expected count less than 5. The minimum expected count is 60.85			

4.6 Relationship between age and App download and use

A Mann-Whitney U test was conducted (see table 8 and 9) to compare age between participants who downloaded health apps (n = 211, mean rank = 188.11) and those who did not (n = 175, mean rank = 199.11). The test revealed no significant difference in age between the two groups, U = 17394.00, z = -1.043, p = .297.

Table 8: Ranks for Age by Health App Download Status

Ranks for Age by Health App Download Status				
	Downloaded Health Apps	N	Mean Rank	Sum of Ranks
Age	Yes	211	188.11	39692.00
	No	175	199.11	34999.00
	Total	386		

Table 9: Mann-Whitney U Test Statistics

Statistic	*Value*
Mann-Whitney U	17394.000
Wilcoxon W	39692.000
Z	-1.043
Asymp. Sig. (2-tailed)	.297

To examine whether these findings held across sub-groups within the Black community, the analysis was repeated for participants identifying as Black African and Black Caribbean. The results were consistent across both sub-categories, with no significant difference in age found between those who had downloaded health apps and those who had not in either group. This indicates that the absence of a significant relationship between age and health app download behaviour was not specific to any sub-group within the Black community in England.

4.7 Perceived wellness and health App use

A crosstabulation was run to analyse the relationship between perceived wellness and health app download and use (table 10). The observed count of participants that perceived feeling well and had downloaded and use a health App was 127, while the expected count was 131. For those that perceived being well and did not download and use health app, the observed count was 115, while the expected count was 111. For those that perceived being unwell and had downloaded and used an app, the observed count was 25 while the expected count was 21. Moreover, the observed count for those that perceived being unwell and did not download and use a health app was 14, while the expected count was 18.

Table 10: Crosstabulation of Perceived Wellness and Health App Use

		Downloaded an App		Total
		Yes	No	
Feels well	Count	127	115	242
	Expected count	131	111	242
Feels unwell	Count	25	14	39
	Expected count	21	18	39

A chi-square test of independence was performed to examine the relation between participants' perceived wellness and downloading and using a health app (table 11). There was no significant relation between these variables, χ^2 *(1, N = 281) = 1.8, p = .176.* The study participants' perceived wellness had no significant impact on app download and use.

Table 11: Chi-Square Test for Association of Perceived Wellness with Health App Download

Value		df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.827	1	.176
Likelihood Ratio	1.856	1	.173

Linear-by-Linear association	1.821	1	.177
N of valid cases	281		
Note: 0 cells (.o%) have expected count less than 5. The minimum expected count is 17.90			

4.8 Relationship Between Having Downloaded and Used Health App and the Preference of Having the Proposed App

71.5% (266/372) of respondents preferred to have an app designed for Black peoples' interest rather than one that is for the general population. A crosstabulation was run to analyse the relationship between having downloaded and used health app (prior health experience), and the preference of having the proposed health app (see table 12 and 13). The observed count of participants that downloaded and used a health app in the past and prefer to have a culturally appropriate health promotion app for Black people was 169 while the expected count was 144. Likewise, the observed count of those that did not download a health app in the past and prefers to have the proposed health app was 32 while the expected count was 57. The observed count of those who did not download a health app in the past and do not prefer to have the proposed health promotion app was 74 while the expected count was 49.

Table 12: Crosstabulation of Prior Health App Use and Preference of the Proposed App

		Downloaded an App		Total
		Yes	No	
Prefers the Proposed App	Count	169	97	266
	Expected count	144	122	266
Does not Prefer the Proposed App	Count	32	74	106
	Expected count	57	49	106

A chi-square test of independence was performed to examine the relation between having downloaded and used an app and the preference of having a culturally

appropriate health promotion app for Black people in England (table 13). The relation between these variables was significant, χ^2 *(1, N = 372) = 33.932, p < .001*. Those that downloaded and used a health app in the past are more likely to want to download and use the proposed health promotion app.

Table 13: Chi-Square Test for Association of Prior Health App Use and Preference of the Proposed App

Value		*df*	*Asymptotic Significance (2-sided)*
Pearson Chi-Square	33.932	1	<.001
Likelihood Ratio	32.602	1	<.001
Linear-by-Linear association	33.840	1	<.001
N of valid cases	372		
Note: 0 cells (.o%) have expected count less than 5. The minimum expected count is 48.73.			

4.9 Influence of the Proposed App on Interest Among Initially Disinterested Participants

Among participants who initially showed no interest in health apps (N = 164), a chi-square of independence (table 14) revealed a significant association between offering a culturally appropriate health promotion app and willingness to download a health app (χ^2 = 4.485, p = .034). Specifically, 69.2% of participants indicated they would download the proposed health app when offered. This suggests that culturally tailored health apps may effectively engage populations previously uninterested in health technology.

Table 14: Willingness to Download the Proposed App Among Non-Adopters

Willingness to Download	Yes	No	Total
Would Download	9 (69.2%)	59 (39.1%)	68
Would not Download	4 (30.8%)	92 (60.9%)	96
Total	13	151	164

4.10 The association of 'Trust' as a reason of not downloading a health App with the preference of having a Black Health App

A crosstabulation was run to analyse the relationship between 'Trust' as a reason for not downloading and using a health app, and the preference of having the proposed health promotion app (table 15). The observed count of participants that did not download and use a health app due to lack of trust but want to have the proposed app was 43 while the expected count was 48. For those that did not download an app due to trust and will not want to have the proposed app, the observed count was 39 while the expected count was 34.

The expected count for those that did not download and use a health app due to reasons not related to trust, the observed count was 25 while the expected count was 20. For those whose reason for not downloading an app was not trust related and would not prefer an app specific to Black people, the observed count was 10 and the expected count was 15.

Table 15: Crosstabulation of 'Trust' as a Reason of not Downloading a Health App with the Preference of Having the Proposed App

		Will Download the Proposed App		Total
		Yes	No	
Trust as a reason for no App download	Count	43	39	82
	Expected count	48	34	82
Trust not a reason for no App download	Count	25	10	35
	Expected count	20	15	35

A chi-square test of indifference was performed to examine the relation between trust being a reason for not downloading an app in the past and preference of having a culturally appropriate health promotion app for Black people in England (table 16). The relation between these variables was statistically insignificant, χ^2 *(1, N = 117) = 3.634, p = .057.* Not downloading a health app because of trust has no significant effect on desire to download and use a culturally appropriate health promotion app for Black people.

Table 16: Chi-Square Test for Association of 'Trust' as a reason of non-App health App use with Preference of Culturally Appropriate App

Value		df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.634	1	.057
Likelihood Ratio	3.737	1	.053
Linear-by-Linear association	3.603	1	.058
N of valid cases	117		
Note: 0 cells (.o%) have expected count less than 5. The minimum expected count is 14.66.			

4.11 Preferred App Features in a Culturally Appropriate Health App

The qualitative content analysis of the open-ended questions on the app features that Black people preferred to see in a culturally appropriate health promotion app yielded

five categories: (1) General information on physical health (2) Information on reproductive health (3) Information on mental health (4) Information on diet and weight control (5) Access to health records and health signposting. Finding on these themes are further discussed below.

4.11.1 General Information on Physical Health

Among the preferred health app features were those related to general information on physical health. This was further divided into 5 sub-themes as follow:

4.11.1.1 Health Information Related to Skin and Hair:

Three respondents mentioned their preference of having a health app that informs them about the ingredients found in both hair and skin care products, especially those that could pose negative health outcomes on Black people's health. This theme also covered a preference of having an app that will provide information on how some health conditions present on the Black skin.

"What do certain conditions look like on Black skin"

4.11.1.2 Information on Non-communicable Diseases:

Hypertension and diabetes mellites were the most mentioned non-communicable diseases that respondents wanted tailored information on. The preference was a focus on prevention rather than treatment. One of them was quoted saying:

"(we want) information on how to reduce risk of developing diabetes in Black people"

A need for information on other non-communicable diseases such as cancers and sickle cell disease was also mentioned.

4.11.1.3 Health Conditions that Disparately Affect Black People More Than Other Races:

There were 8 mentions of participants' preference of having an app that will provide them with information on health conditions that are either specific to the Black people or affect Black people disproportionately. Such information should as well include

preventative measures tailored to their need. One of the participants stated the following:

> *"(we want to know the) most common signs of (the) most common diseases. (we want to know) the early warnings signs and symptoms, and (the) app having preventative measures should be key factor"*

Some emphasis was placed on having an app that will provide tailored health information. Such focus should be specific to Black people and health interventions that address the health challenges the community faces.

> *"(we want to see) things tailored to us as Black individuals, the things that we must do that others (White/other ethnic backgrounds) mustn't"*

4.11.1.4 Awareness on General Issues Regarding Health:

3 respondents reported a health app preference that falls within this theme. They wanted to see more awareness campaigns on vaccines, information on blood and organ donation, and having an open platform for Black people to discuss issues regarding their health freely.

> *"(we want) awareness around the stigmas affecting Black people and health, unpacking myths surrounding Black people and health. We want to have an open community (platform) for Black people to discuss their health freely."*

Also, 14 participants mentioned preferences of having a health app that feature general wellbeing functions such as mindfulness, sleep, productivity, and wellness in general.

4.11.2 Information on Reproductive Health:

Themes related to reproductive health were mentioned by 8 respondents. Fertility and menstrual health had the most mentioned with 2 respondents mentioning the need for

information on sex and sexual aid. The need for information on sexually transmissible diseases such as HIV was also mentioned.

"Sexual health aid" ... "mensuration and fertility" ... "sex" ... "information on HIV"

4.11.3 Information on Mental Health:

5 respondents mentioned their preference of having health app features relating to mental health. Among these was an interest in having an app feature that could help with managing microaggression and stress related issues. Incorporating Black history and culture into a mental health and wellbeing feature on the app was also an area of interest.

> *"we want cultural ideas and history to be part of the mental wellbeing section"*

4.11.4 Information on Diet and Weight Monitoring:

9 respondents mentioned their preference of having a health app feature relating to diet and weight control. These were further divided in two sub-themes: weight specific diet, and food relevant to Black culture and health. The theme on weight specific diet captured participants' preferences in a culturally appropriate health promotion app that could inform the users about the number of calories in their food, provide information on how to lose weight, and encourage healthy eating. The theme on food relative to the Black culture and health captured participants preferences such as having an app feature that provides useful health information on Black peoples' traditional and cultural food.

> "*We want the app to adapt different cultural foods and to make them more healthy etc"*

4.11.5 Access to Health Records and Health Signposting:

5 participants mentioned preferences that fit in this theme. These included having an app feature that would enable users to have access to their medical records and to physical health facilities. There was a mention of having a feature that enables referral to health specialists. One participant stated the following:

"Signposting to relevant alternative health specialists"

Having an app feature that enables Black people to access and participate in research that are aimed at improving their health was also mentioned. One participant stated the following:

"Information about how black people can enrol in clinical trials and research studies, so our health is better researched"

4.12 Patterns of Health App Utilisation Among Black People in England

The qualitative content analysis of the open-ended question about the types of apps used by the participants yielded 6 areas of interest. These were based upon what the participants said was the focus of the apps they download and used. These are descriptively summarised in 6 areas of interest: (1) physical activity and exercise apps (2) diet and weight monitoring apps (3) apps for accessing health records, information, and services (4) apps for reproductive health (5) apps for general wellbeing, and (6) apps for mental health.

4.12.1 Physical Activity and Exercise Apps:

Exercise and physical activity formed one of the themes with the highest mention. 27 participants stated the app they used as either being to monitor their activity or for exercise. Some of these app had health related features.

"How much walking was done; how much running was done and how the heart rate was and how long it took to run a certain distance"

4.12.2 Diet and Weight Monitoring Apps

This was an area of health app interest that had a high mention among respondents, with 27 of them mentioning they had used health apps that focused on either monitoring their diet, weight, or both.

4.12.3 Apps for Accessing Health Records, Information, and Services

This health use pattern represents health apps that were used to access health services such as appointments with general practitioners (GP), and as well NHS Apps for health records, Covid-19 related apps. There were 13 participants that stated having used apps for this purpose.

4.12.4 Apps for Reproductive Health

This health app use pattern represented apps used for tracking and monitoring menstrual cycle, ovulation, and women's health, and 8 participants stated having used health apps that fell in this category.

4.12.5 Apps for General Wellbeing

This health app use pattern covered health apps that focussed on wellness such as mindfulness, sleep, meditation and monitoring the amount of water drank. 8 participants mentioned having used apps that fit within this category.

4.12.6 Apps for Mental Health.

This category represents apps that were used for the purpose of mental health and wellbeing and 2 participants stated having used health apps for this reason. However, there was no mention of what specific area mental health these apps focussed on.

4.13 Discussion: Summary of Key Findings

This study examined health app adoption among 387 Black people in England to assess the feasibility of a culturally appropriate health promotion app and to examine relationships between self-perceived health status and app adoption. The results revealed moderate prior app adoption, acceptance contingent on governance and

trust, implementation challenges related to professional recommendation disparities, and that self-perceived health status does not predict health app adoption in this population.

4.13.1 Objective 1: Feasibility of a Culturally Appropriate Health Promotion App

The 54.8% prior app adoption rate aligns with the UK national average of 47% (ORCHA, 2022), demonstrating substantial demand for health technology among Black people. However, 94.3% of users downloaded only 1-5 apps, indicating limited sustained engagement which differs from findings from a US population which indicated that over 42% of the population had downloaded 6 or more health apps (Kreb and Duncan (2015). In addition, 70.9% of those with prior health app experience had discontinued a health app they previously downloaded, and loss of interest was the predominant reason (57.9%). This aligns with the global pattern of health app discontinuation rate as Leigh et at (2024) showed that 70% of health users discontinue within 100 days. This indicates that while demand exists, sustainable engagement requires intentional design.

The study reveals that acceptance of a health promotion app is conditional on governance and trustworthiness. Trust concerns (70.6%) and perceived lack of need (71.8%) emerged as barriers for acceptances of health apps for those that did not have prior health experiences. However, a critical finding is that trust concern as a reason for no prior health app use, did not significantly predict interest in the proposed culturally appropriate health promotion app. This suggests that community-centred design may overcome mistrust in health apps. Trust in digital health depends substantially on whether technology is perceived as serving community interests and reflecting community values (Chibi and Galea, 2025). Prior health app use was the strongest predictor of interest in the proposed health promotion app, and this suggests

that positive experiences build receptiveness to new health apps. The demographic analysis reveals that health app acceptance was significantly more likely for females than males, suggesting that targeted design for male user may enhance acceptance. Age showed no effect on health app acceptance, contradicting the digital divide assumptions.

The implementation of the proposed health promotion app faces a critical challenge. Only 40.3% of the respondents reported ever being recommended a health app by a healthcare professional, which is below that 55% national average (ORCHA, 2022). This mirrors broader digital health inequalities, with NHS App registration and use higher in practices serving predominantly White populations (Kc et al., 2024). In addition, the 70.9% discontinuation rate of prior health apps used, which was mainly driven by loss of interest (57.9%), highlights that implementation must prioritise sustained engagement.

4.13.2 Objective 2: Self-reported Perceived Health Status and Health App Download and Use

This study reveals that perceived health status has no significant association with health app download and use among Black people in England ($\chi^2 = 1.8$, $p = .176$). This finding supports a health promotion approach and suggests that the proposed app will not need to depend on users perceiving themselves as feeling unwell to be motivated to engage with it. This expands potential reach to populations focussed on preventions and wellbeing promotion regardless of current health status perception.

4.14 Conclusion

Study 1 established that developing a culturally appropriate health promotion app for Black people in England is feasible, with demonstrated demand, contingent acceptance, and implementation challenges primarily related to genuine trust

concerns. The finding that trust concerns do not preclude interest in the proposed health promotion app, and that health status does not predict adoption, reveals that receptiveness depends on governance, design quality, and community involvement rather than individual characteristics. These quantitative findings establish the *"what*" and "*why"* of health app adoption, but leave the implementation question, *"how"* should a culturally appropriate health promotion app for Black people in England designed, unanswered. Study 2 addresses this gap through a qualitative exploration using user-centre design principles, community development approaches, and the Health Belief Model framework. This participatory approach ensures that the app design reflects Black communities' health priorities, values, and preferences, maximising cultural appropriateness and potential sustained engagement.

CHAPTER FIVE

Methodology for Study 2: A Qualitative Study Exploring the Design of a Culturally Appropriate Health Promotion App for Black People in England

5.0 Overview of the Chapter

This chapter presents the detailed methodology for Study 2, a qualitative study exploring the design of a culturally appropriate health promotion app for Black people in England. Study 2 sought to explore the ideas, experiences, and perceptions of Black people in England regarding the content, acceptability, demand, and implementation of a culturally appropriate health promotion app, incorporating user-centred design principles and Beattie's (1991) community development approach to health promotion. The overarching methodological framework underpinning this study, including the exploratory sequential mixed-methods research design, the pragmatic philosophical positioning, and the overall Study 2 design and rationale for adopting a qualitative focus group discussion approach, has been presented in Chapter 2 and will not be repeated here. This chapter focuses specifically on the methodological components of Study 2. It begins by describing the study participants, inclusion and exclusion criteria used to determine eligibility for participation. The sampling strategy adopted is then outlined, providing rationale for the approach taken. This is followed by a description of the interview schedule, which was created with constructs of the Health Belief Model. The data collection procedure is then detailed, explaining how the focus group discussions were conducted and the steps taken to recruit participants. The chapter subsequently presents the data analysis approach, describing the qualitative analytical methods employed to address the study objectives. Finally, ethical considerations

relevant to Study 2 are discussed, including issues of informed consent, confidentiality, and ethical approval.

5.1 Study Recruitment

The study participant recruitment process was boosted by offering each participant a £15 shopping voucher for their time. Funding was granted for this process by the university (see Appendix 2.7). The PhD researcher's experience in study 1 was that some potential participants were reluctant to take part in the study, citing *'a waste of time'* and that no '*impact will be felt'* as some reasons. The offering of incentives to participants as a recognition of their time was supported by Singer and Ye (2012), as its contrast could result in fewer participants taking part. In addition, study 1 showed that many participants did not provide their contact details for them to be contacted again to take part in study 2, and this could be due to the trust concerns discussed in Chapter 1, which are supported by the findings from study 1. The participants that provided their email addresses were contacted and invited to take part in the focus group discussions. Moreover, a good rapport was already built with some of the Black community organisations gatekeepers during study 1 data collection, and these community organisations were sent a written request for participants access through their organisations and networks (Appendix 2.1).

To broaden the participant catchment area and be more inclusive, the research advertisement was shared on social media platforms such as Facebook, WhatsApp, and Twitter (now known as X), inviting eligible participants to take part in the study. Permission was sought from the social media groups' administrators to allow the research advertisement to be shared on their platforms (see Appendix 2.1). The use of social media platforms such as Facebook helps disseminate research invitations to wider audiences and therefore increases the chances of attracting more eligible

participants to take part in a study (Khatri et al., 2015). Even though Arigo et al. (2018) argued that conventional recruitment techniques are more effective than using social media platforms for recruiting study participants, it was ideal to explore and utilise all possible techniques for participant recruitment, as the population under study was regarded as reluctant to participate in research due to historical mistrust and racism. As discussed in earlier sections, this designation is arguably another convenience for the continual isolation of marginalised population. Even though the researcher acknowledged that Leach et al. (2017), suggested that online study participants recruitment stands a risk of being over-representative of younger participants, the restrictions posed by the Covid-19 pandemic at the time made online participant recruitment an ideal approach for this study.

Another technique used in the participant recruitment process was snowball sampling, which is a technique in which an initially identified small group of participants help the researcher identify and reach potential participants who may meet the recruitment criteria and might be willing to participate in the study (Bryman, 2016). Gatekeepers to Black community networks and organisations were written to (Appendix 2.1) for their assistance in accessing participants in their communities. Moreover, the eligible participants who had signed up for participation in the study, were encouraged to share the research advert with people in their networks who might meet the recruitment criteria and might be interested in taking part. Although qualitative research does not require a representative sample as it is rather concerned with transferability, the researcher acknowledged that the snowball sampling technique is often critiqued for its limitations of not fulfilling the criteria of random sampling, as it is entirely based on the convenience of a network, which poses a risk of missing out on the representativeness of the sample (Parker, 2019). However, it was a good choice to

explore all possible avenues that could increase the chances of reaching more potential participants. Using a snowball technique also helped build trust between the participants and the researcher (Waters, 2014) and may have enabled participants to feel confident in participating in the focus group interviews.

5.2 Study Participants Eligibility, Inclusion, and Exclusion Criteria

The study participants were Black people living in England aged eighteen and above at the time of data collection. Thirty-six participants took part in eight focus group interviews. Focus groups were chosen as the primary data collection method due to their effectiveness in exploring shared experiences and generating rich, interactive data through group dynamics (Krueger and Casey, 2015). The group size ranged between four and six participants per session, aligning with recommendations that smaller focus groups facilitate deeper discussion and ensure all participants have adequate opportunity to contribute (Carlsen and Glenton, 2011; Nyumba et al., 2018). Two focus groups were conducted face-to-face, with one held at Birmingham City University's City Centre Campus, while the other was held at a gatekeeper's office in Newcastle. The remaining six focus groups were held online via Microsoft Teams. This mixed-mode approach was adopted to maximise accessibility and accommodate geographical diversity, reflecting emerging best practices in qualitative research that demonstrate online focus groups can yield data comparable to quality in face-to-face sessions while increasing participant convenience and reach (Archibald et al., 2019; Lobe et al., 2020)

Due to participants having been recruited online and with optional online or face-to-face participation in the focus group interviews, participants were sparsely distributed in geographical locations within England. Although a complete demographic data is important for contextualising findings in qualitative studies (Andersen and Risør, 2014;

Kuhlicke et al., 2011), this was not collected from the participants, due to many in study 1 not sharing this data in the study and therefore quitting the questionnaire before responding to the rest of the questions that came after the demographic data questions. The researcher was also aware that collecting and analysing the demographic characteristics in qualitative studies could reduce the risk of the assumption that a phenomenon of interest is the same across a sample regardless of differences in demographic characteristics (Hammer, 2011).

Inclusion and exclusion criteria help researchers identify attributes and characteristics that prevent non-eligible participants from participating in given research (Gray et al., 2017), which is vital in maintaining high quality research (Patino and Ferreira, 2018). Therefore, to participate in the study, participants were only considered eligible if they were aged 18 years and above, identified as Black African, Black Caribbean, or had any Black background; and were living in England at the time of the focus group interviews. They also needed to speak and understand English language as there was no access for funding to include non-English speaking participants. People who did not meet all these criteria were excluded from taking part in the study (see table 18 below).

Table 17: Inclusion and Exclusion Criteria for Taking Part in a Focus Group Discussion

Inclusion	Exclusion
Self-identify as Black (African, Caribbean, or had any Black background)	Not self-identifying as Black or have any Black background
Age 18 years or older	Anyone below the age of 18
Resident in England	Not living in England at the time of data collection
Able to take part in English language focus group	Inability to speak or understand English
Willing to have discussion audio recoded	Unwillingness to be part of an audio-recorded discussion
Signed informed consent form	Not signing the consent form.

5.3 Sample Size

Qualitative researchers aim to explore meanings, and they therefore collect data on perceptions, experiences, and behaviour towards a phenomenon under study (Tenny et al., 2017). The sample size for qualitative research depends on the number needed to reach data saturation (Bryman, 2016). According to Guest et al. (2016), 90% of themes could be discovered within three to six focus group interviews. However, it is unlikely for researchers to know the exact number of focus group interviews needed to reach saturation right at the onset of the research (Bryman, 2014). Therefore, ethical approval was sought to conduct a maximum of eight focus group interviews. A total of 36 participants took part in the 8 focus group interviews; 6 were conducted online using Microsoft Teams, and two were done face-to-face. This was arguably a large sample size for a qualitative study, however, Rabiee (2004) suggested that 6 to 10 participants per focus group interview is generally considered manageable and has the potential to provide a variety of views. The number of participants in this study was therefore

not considered too large or small, and it was better to avoid a small number of participants in a focus group as this runs a risk of becoming '*disorderly or fragmented*' (Rabiee, 2004). In addition, Bryman (2016) suggested it was better for a researcher to not entirely rely upon the assumption of what makes a good sample size in qualitative research, but to rather take into consideration the method employed, why it was used, and why the size chosen is appropriate. The population studied in this research, even though collectively termed the Black community in England, was not considered a homogenous population (see chapter 1), as some came from a Black Caribbean background and some came from a Black African background. Some Black Africans, for example, mostly came from different countries in Africa to England and do not share the same cultural beliefs and experiences integrating in the country (Mitton and Aspinall, 2010). This may have an impact on their views and perception on the issues explored in this study. Therefore, a larger sample was considered ideal for allowing an opportunity for a wider representation of the views of the Black community as the app is aimed for the entire Black community in England.

5.4 Focus Group Data Collection

Data collection was carried out using both face-to-face and online focus group discussions. These are discussed separately in two sub-sections below:

5.4.1 Setting Up the Online Focus Groups

Online focus group discussions were selected as the primary mode of qualitative data collection method in this study in recognition of the challenges posed by the Covid-19 pandemic on face-to-face research. Online data collection has been identified as one of the most effective methods for addressing practical constraints such as time, cost, and the geographic dispersal of participants (Forrestal et al., 2015) Given that the study aimed to recruit participants from across England, and that data collection via

Microsoft Teams was the most appropriate and equitable approach. Although online focus group discussions became more widely used during the Covid-19 pandemic, robust methodological guidance was still emerging at the time of data collection. The online focus groups in this study were therefore conducted in accordance with the recommendations of Willemsen et al (2022). In preparation for each session, participants were provided with a Microsoft Teams meeting link in advance, along with clear written guidance on how to access and navigate the platform. They were also informed of the technical protocols to follow during the session, including how to use the 'raise hand' function on Microsoft Teams to indicate when they wishes to speak, which was adopted as a ground rule for all online sessions to prevent participants from speaking over one another and to facilitate transcription of the data. Participants were additionally advised on what steps to take should they experience any technical difficulties during the session, and they were reassured that they could rejoin the meeting using the same link if disconnected.

Each online session was hosted and manged by the PhD researcher, who acted as both the platform host and the focus group moderator. As the host, the researcher admitted participants from the Microsoft Teams 'waiting room' individually, managed screensharing where required, for example, when presenting the proposed app prototype (Appendix 3.1) to participants, and monitor the session for any technical issues. As the moderator, the researcher guided the discussions using the structured interview schedule (Appendix 2.4), ensured all participants had equal opportunities to contribute, and maintained the focus of the discussion on the research questions. The dual role of the host and moderator required careful preparation prior to each session, including a pre-session check of all technical settings, the sharing of screen -share permissions, and confirmation that the recording function was active with participants

prior informed consent. Recruitment for the online focus groups was conducted through a multi-channel approach. Posts advertising the study were shared across social media platforms and online community networks commonly used by Black communities in England, including Facebook groups, WhatsApp community groups, and Twitter. Interested individuals were invited to contact the researcher directly to register interest, following which they were sent a participant information sheet (Appendix 2.2) , a consent form (Appendix 2.3), and a Microsoft Teams meeting invitation containing the session link. Confirmation of attendance was sought from all registered participants in the days preceding each session, and a reminder was sent on the day of the session to maximise attendance. Despite this, one session experienced lower attendance than anticipated, with only three participants joining. This shortfall did not, however, compromise the quality of the data, as the discussion within that group flowed well and generated rich and substantive contributions consistent with the other sessions.

5.4.2 Setting Up the In-person Focus Groups

Two in-person focus group discussions were conducted to compliment the online data collection, offering an alternative mode of participation for those who felt confident and comfortable engaging face-to-face. These were conducted in strict accordance with the government's rules and regulations regarding face-to-face contact during the Covid-19 pandemic and took place once it was safe to do so under the prevailing public health guidelines at the time. Each of the two in-person focus groups comprised eight participants. The first was held in a dedicated focus group discussion laboratory at Birmingham City University (BCU), which provided neutral, accessible, and professionally equipped environment conducive to open and confidential discussion. The room was purpose-designed for focus group research, featuring a round table

seating arrangement that facilitated equal participation by ensuring no single participant was positioned at a head of the table, thereby reducing hierarchical dynamics within the group (Kitzinger, 1994). The round table format was adopted deliberately to create a comfortable and inclusive environment in which participants felt encouraged to share their views freely.

The second in-person focus group was held at the office of a community gatekeeper based in Newcastle. The decision to utilise community setting for this session was grounded in both practical and ethical considerations. Practically, it enabled the PhD researcher to reach participants in Newcastle who might not have been willing or able to travel to a university setting. Ethically, it acknowledged the well-documented historical mistrust of research institutions within Black communities, rooted in the legacy of exploitative unethical research practices such as the Tuskegee syphilis study, the impact of which continues to generate scepticism towards research participation among Black people (Shavers et al., 2002; Yearby, 2017). Conducting the focus group within a familiar and trusted community space by leveraging the established relationships between the gatekeeper and local community members was a strategy used to facilitate recruitment and to create an environment in which participants felt safe, respected, and confident in the integrity of the research process (Bashir, 2023).

The community gatekeeper played a central role in recruitment for the Newcastle focus group. Having been briefed on the aims, objectives, and ethical parameters of the research, the gatekeeper disseminated information about the study to their networks. They identified eligible participants and facilitated initial contact between interested individuals and the PhD researcher. This gatekeeping approach is recognised as an effective and culturally sensitive strategy for recruiting participants from communities that may be cautious about engaging with academic research (Liamputtong, 2010).

The gatekeeper's involvement was instrumental in building the trust necessary to achieve adequate participation from a community in which mistrust of research is a documented barrier to engagement.

The round table seating arrangement used at BCU was replicated at the gatekeeper's office to maintain consistency in the physical setup of both in-person sessions. Each in-person focus group was audio recorded using a digital recording device obtained from the BCU Psychology Technician Department, with the explicit informed consent of all participants obtained prior to the commencement of recording. The recorded data were subsequent transcribed verbatim by the PhD researcher and subjected to framework analysis.

5.4.3 Procedure Common to All Focus Group Sessions

A consistent procedural framework was applied across all focus group sessions, whether conducted online or in person, to ensure methodological integrity and comparability of the data. At the onset of each session, participants were given the opportunity to review the participant information sheet (Appendix 2.2), which they had received in advance, and to raise any questions or concerns. They were reminded that participation was entirely voluntary, that they could withdraw from the study or have their data withdrawn at any point up to the date stipulated in the information sheet, and that the session would last up to 90 minutes and be divided into two parts.

The PhD researcher introduced himself at the beginning of each session and thanked participants for their time. Participants were then given a few minutes to introduce themselves if they wished and to engage in informal conversation to establish a sense of comfort and familiarity within the group, consistent with Bryman's (2016) recommendations for beginning focus group discussions. The researcher then provided a verbal overview of the rationale for the study, drawing on evidence of health

inequalities affecting Black communities in England, and read out the aims and objectives of the research to ensure transparency of purpose. Participants were informed that their contributions had the potential to directly influence the design of a culturally appropriate smartphone app for Black people in England, which served to affirm value and significance of their participation.

To ensure transparency and accountability throughout the data collection process, one of the PhD supervisors was informed at the start of and end of each focus group session. This practice provided an additional layer of safety and oversight, consistent with ethical guidance on researcher wellbeing and accountability in qualitative research (Dickson-Swift et al., 2007; Economic and Social Research Council, 2015). At the close of each session, a participant debrief sheet (Appendix 2.5) was read aloud to participants and a copy was provided to each of them, ensuring they had access to relevant information including details of support services should any of the topics discussed have prompted any personal concerns.

5.6 The Focus Group Interview Schedule

All the focus group interviews were guided by the interview schedule (see Appendix 2.4), which was designed using the Health Belief Model (detailed in Chapter 1) as a framework in addition to the three aspects of feasibility (demand, acceptance, and implementation) of the proposed app examined in this research. The constructs of the model were used to guide the design of the interview schedule, focussing on the three feasibility areas. Each of the constructs of the model represented a theme of questions that addressed at least one aspect of the feasibility and design of the app. The first theme addressed questions regarding perceived benefits of having a health promotion app for Black people in England. One of the questions in this theme was: What do you think some of the benefits of having a Black Health App would be? This was carefully

placed as the first set of questions for the focus group interviews, as these were general questions based on personal preference, which were thought could encourage participants to start a discussion. The focus group interviews flowed in this pattern sets of questions addressing one theme after another as follows:

- Perceived barriers to downloading and using the proposed app were explored with these three questions: (1) tell us about some of the things that could affect your ability to use a health app. (2) Is there anything that could potentially stop you from using a health app? (3) Is there anything that would stop you from using a health app that is specifically for Black people?
- Motivation towards downloading and using the proposed app was explored using three questions: (1) If you downloaded a health app to your phone, what makes you want to continue using the app? (2) What keeps you interested or motivated to use the App? (3) Gamification “is the use of game design elements in non-game contexts.” Examples of apps that use gamification include Headspace, eBay, Duolingo, and Nike + Run Club. Do you find app activities such as gamification more interesting than just accessing information or not, and why?
- Information on illness susceptibility and severity, and its relation in prompting action were explored with these questions: (1) If the proposed app could tell how susceptible someone is to a particular disease, how would this information affect the person’s health? (2) If the app could tell us about the seriousness of contracting an illness or disease, or the severity of the consequences of leaving it untreated, how would this affect one’s health or the actions taken towards one’s health?

Perceived ideal culturally appropriate app prototype was explored by showing participants an example of an app prototype (Appendix 3.1) designed by the PhD researcher and informed by the findings from Study 1. This is discussed in detail in section 5.6.1 below.

5.6.1 The Design Prototype and Drawing Task

The focus group sessions were divided into two parts: a structured discussion of one hour, followed by a 30-minute participant generated drawing task after a short break. The drawing task was underpinned by participant-generated images methodology described by Guillemin and Drew (2010) and was embedded within the concept generation and ideation stage of the user-centred design framework adopted in this thesis (McCurdie et al., 2012). To contextualise the drawing task, participants were first shown a design prototype (Appendix 3.1) developed by the PhD researcher from the findings of Study 1, in which participants had identified their preferred health topic, content areas, and app features. The prototype (Appendix 3.1) depicted a provisional app layout which included a home screen and content categories, reflecting Study 1 findings. This served as a visual stimulus to give participants a shred reference point from which to generate, challenge, or extend the initial design concepts (Sanders and Stappers, 2008). Participants were then invited to respond to the following questions:

- What do you think of the categories?
- What are some of the things you think should be added?
- What kind of contents would you like to see in each category?

Following this discussion, participants were invited to produce a freehand sketch of what they considered an ideal culturally appropriate health promotion app for Black people in England. The task was introduced in accessible language, with participants explicitly informed that artistic quality was not a focus, rather, the researcher's interest

lay in their ideas and design thinking. This framing was intended to reduce self-consciousness and reinforce participants role as active co-designers throughout the process (McCurdie et al., 2012).

In-person participants were each provided with an A4 sheet of paper and a pencil. Online participants were asked in advance to bring a paper and a pen or pencil to the session. Upon completing their drawings, online participants were invited to hold their drawings up to their cameras for the researcher to capture via a screenshot, or to take a photo and email it to the researcher after the session. All participants were requested not to write their names on their drawings, ensuring anonymisation of the visual data consistent with the ethical commitments outlined in the participant information sheet (Appendix 2.2). Consistent with Guillemin and Drew's (2010) framework, participants were asked to explain their drawings to the group upon completion, articulating their design choices and the features they considered most important. These verbal explanations were audio recorded alongside the focus group discussion and incorporated into the analysis together with the drawings, yielding richer dataset than either data source alone would have provided. Upon conclusion of each session, a participant debrief sheet (Appendix 2.5) was read aloud and distributed to participants. The PhD Director of Studies was informed at both commencement and conclusion of each session, ensuring supervisor oversight, accountability, and the availability of emergency contact if required (Dickson-Swift et al., 2007; Economic and Social Research Council, 2015)

5.7 Ethical Considerations

Ethical approval was granted from the Business, Law, and Social Sciences Faculty Research Ethics Committee at Birmingham City University (*ref: Gai /#10231 /sub1 /R(A) /2022 /Apr /BLSS FAEC - Design of a Black Health Education/Promotion App*)

(see Appendix 2.6). To fulfil the requirements of an informed consent (Antoniou et al., 2011), participants were provided with the participant information sheet (Appendix 2.2) and were also given opportunities to ask questions. Participants were informed through the information sheet and verbally, before taking part, that their data will be anonymised to hide their identity, and that they could withdraw from the study at any point without prejudice. They were also informed that the research was being conducted in partial fulfilment of a requirement for a doctoral degree and that the findings were going to be written up as part of the researcher's thesis and will be prepared for publication in academic journals and conferences.

Being aware that the researcher might not know when a participant gets distracted during an online focus group interview (Bryman, 2016), participants were made aware at the beginning each session that they could take a break at any point in time, or chose to join a later group if they wished, and based on availability, if they got caught up with anything that might hinder their attention or distract them from active participation. However, this did not occur in any of the focus group discussions, and no participant expressed any sign of distress or a need for a break.

Although this research topic was unlikely to involve asking participants about issues that were more distressing than those encountered in everyday life, there was a possibility that someone might have said something upsetting in the focus group. If this were to happen, provisions were made to report it to the supervision team, and the PhD researcher was also aware of the support available for students' wellbeing through the university. The participants were advised to seek support from the NHS and their GPs, and they were also provided with a debrief sheet (Appendix 2.5) which contained supportive information including links for accessing NHS services and GP surgeries.

5.7.1 Confidentiality

Each participant was given a pseudonym after the focus group discussions were completed, and they all had their personal information removed from the transcripts as soon as transcription was completed. During the focus group discussions, participants were asked to maintain confidentiality as individual members of the same focus group were able to see and or hear others within the group they participated in, both in the face-to-face and online sessions. Restrictions were also made on access to the online recording, and therefore no one except the researcher and his supervisors were able to access the recordings after the sessions. These recordings were deleted once the transcriptions process was completed. The transcripts were anonymised using pseudonyms and stored in the PhD researcher's password protected BCU OneDrive account, in accordance with the BLSS Data retention guidance, and were accessible only to the research team. The consent forms were also stored but kept separate from the research data in the researcher's password protected BCU OneDrive account. The anonymised research data was to be kept in the PhD researcher's BCU OneDrive account for 10 years after the completion of the project in accordance with BCU's policy and will then be permanently deleted thereafter in accordance with the Data Protection Act (2018) and the British Psychology Society (BPS) Code of Human Research Ethics (2021).

To minimise risk of covid-19 transmission during data collection, the face-to-face focus group interviews were conducted with strict adherence to the UK government's guidance. Participants were asked to participate in a face-to-face focus group only if they wished and felt confident doing so, and they were advised to stay home if they had experienced any symptoms suggestive of Covid-19 infection. The face-to-face

focus group interviews were only carried out in public places such as the BCU campus and at community gatekeeper's office.

5.7.2 Withdrawal Procedure

In line with the regulations outlined by the British Psychological Society, participants were informed that they could stop taking part in the research study at any time without explanation. They were also informed that they would still be entitled to the same benefits as an individual who completes the study if they chose to withdraw at any time. For withdrawal of their data, participants were informed through the participant information sheet (Appendix 2.4) that if they wished to withdraw from the study, they needed to contact the researcher within seven days from taking part in the study. They would also need to provide their personalised pseudonym within the timeframe. Due to the nature of focus group interview data, participants were made aware that it was not possible to withdraw their individual data from the transcript once it had been made pseudonymous. However, they were reassured that all necessary steps were to be taken to remove individual data from the analysis and final project output.

5.7.3 Consent

The researcher was responsible for obtaining consent from the participants. The participants were given an information sheet (Appendix 2.2) which provided clear and adequate information about the project. They were asked to indicate when they would be available from a range of dates and times for their participation in a focus group interview. The information sheet covered information such as the name of the researcher's institution, the aim of the research, type of data collected and how, issues concerning confidentiality, anonymity, and choice of withdrawal from study at any point before the data was analysed. It also provided an estimate of the average time needed to participate in a focus group interview. A written informed consent (Appendix 2.3) was

then obtained from each individual participant included in the study and this was either paper signed for those that participated on face-to-face focus group interviews or electronically signed for those that participated in the online ones. The signed papers of the consent forms were scanned and saved to the PhD researcher's BCU password protected OneDrive account, and these were destroyed through the BCU confidential waste bins on campus.

5.8 Data Analysis Process

5.8.1Transcribing the Focus Group Interviews Data

Data transcription is an important step in qualitative research, as it brings the researcher closer to the data (Bryman, 2016). Therefore, despite the amount of time and attention required, the PhD researcher transcribed all the data verbatim. For the focus group interviews conducted via Microsoft Teams, a transcript was generated by Teams, but this was not entirely accurate. Therefore, the researcher cross checked these transcripts against the actual audio/video recorded data verbatim. All the face-to-face focus group interviews were manually transcribed verbatim, with participants' names replaced with pseudonyms created by the researcher. Each transcript was given a unique code for easy identification.

5.8.2 Framework Analysis of Focus Group Data

The data from the focus group discussions were analysed using framework analysis, which is a structured qualitative method originally developed by Richie and Spencer in the 1980s and widely adopted for it its systemic and matrix-based approach to managing and interpretating qualitative data (Gale et al., 2013). Framework analysis sits within the broader family of thematic analysis and qualitative content analysis and identifies commonalities and differences across the data before focusing on relationships between themes to produce descriptive and explanatory conclusions

(Gale et al., 2013). According to Gale et al. (2013), the defining feature for framework analysis is the matrix output and this enabled the PhD researcher to deductively use the Health Belief Model as an analytical framework. This approach was well suited for this PhD research as it enabled both shared and divergent perspectives to be systematically examined. Gale et al. (2013) supported a deductive approach being appropriate where analysis is grounded in pre-existing theory, where codes and themes are selected based on established theoretical constructs rather than generated inductively from the data. The Health Belief Model's constructs, perceived benefits, perceived barriers, perceived susceptibility, perceived severity, and cues to action, served as the primary thematic components of the analytical matrix. This ensured conceptual coherence between the focus group interview guide and the subsequent analytical process. The approach aligns with established research practice using the Health Belief Model to inform qualitative research. Mehta et al. (2013) explored the acceptability predictors of HPV vaccine among male students in college using focus group discussions which were designed using the constructs of the Health Belief Bodel. Even though they did not explicitly state the use framework analysis in their study, their approach of conducting a thematic analysis based on the constructs of the Health Belief Model aligns with what Gale et al. (2013) regarded as framework analysis. While the deductive framework was primary in this PhD research, space was retained within the analysis process for inductively derived codes to emerge where participants' data exceeded the boundaries of the pre-defined categories, which is in line with the recommendations of Gale et al. (2013).

Analysis was done using the seven stages of framework analysis identified by Gale et al. (2013), and these were applied systematically and reflectively to the focus group

data. NVivo (version 12) was utilised primarily as a tool for data management and organisation throughout the data analysis process.

The first stage involved the transcription of the data were all the focus group discussions were transcribed verbatim. This was a crucial step as the content of the participants' account, and not the paralinguistics features on interaction, was the primary unit of analytical interest (Gale et al., 2013). Once all the data were transcribed and anonymised, each transcript was given pseudonyms to hide the participants' identity (Lahman, Thomas and Teman, 2022). The PhD researcher used motivating words in Wolof, his native Gambian language, to keep him motivated and close to the data throughout the data analysis process. Some examples of these pseudonyms included *'Dolleh Hamam'* which means knowledge is power; '*Werguyaram Jarnaluneh'* which translates as good health is worth everything; and *'Fagaru Moginfaju'* which translates as prevention is better than cure. These pseudonyms did not only create connection to the data, but it also gave realistic representation of Black African names which often carry deep meaning. The researcher was also aware of some Black people having western names, and therefore included pseudonyms such as *Zack Barret, Kate Carroll,* and *Christy Roads,* to give that data a clearer representation of the Black community in England.

The second stage involved familiarisation of data. All the transcripts were then read in full before being directly imported into NVivo. This enabled the researcher to develop a holistic impression of the data, attending not only to the explicit content but also to the tone and emphasis participants collectively negotiated meaning within the focus group context. NVivo's memo function was utilised at this stage to record preliminary analytical impressions and observations against each transcript.

The third stage involved coding which was done within NVivo using the software's node structure to apply descriptive and conceptual labels to analytically significant passages of data. According to Bryman (2016), a code is *"a collection of references about a specific theme, place, person, or other area of interest"*. Coding stripes were used to visualise the portions of the texts that were coded. This was helpful in preventing the omission of any part of the transcripts that could be useful in the analysis. Given the deductive nature of this study, the constructs of the Health Belief Model were established as parent nodes prior to coding. This also provided the primary framework against which transcript data were systematically read during the familiarisation stage. Consistent with Gale et al. (2013), open coding was also conducted on the initial transcript to ensure that dimensions of participant experience not captured by the framework were not inadvertently suppressed. This was particularly important for analysing the data regarding the app prototype drawings from participants (Appendices 3.2, Image AP1 to Image AP9).

The fourth stage on Gele et al.'s (2013) analysis procedure involves developing a working analytical framework. This stage requires all researchers to meet and compare and agree on the codes to apply to the data. Because this was PhD research and the researcher was solely responsible for analysing the data under the close supervision of the supervisors, the researcher instead presented preliminary findings to the supervisors using PowerPoint presentation, and with their recommendation and feedback, some themes were merged to avoid repetition. As Gale et al. (2013) recommended, the analytical framework was treated as provisional at this stage and was opened to revision.

The fifth stage involved applying the analytical framework systematically to all the transcripts. NVivo's coding query and coding stripe function were used to verify the

consistency and comprehensiveness of indexing across all the transcripts. This allowed the researcher to review which passages have been coded, identify any gaps in coverage, and ensure that no analytically significant data had been overlooked. Findings at this stage were again presented to the supervisors and their recommendation and feedback were addressed.

The sixth stage involved charting the data into the framework matrix. Indexed data were charted into framework matrix using the framework matrix function on NVivo. Here, the findings were written up employing a systematic interrogation of the completed NVivo framework matrix to identify patterns, theme, and explanatory relationships within and across cases. This generated a matrix output directly from the coded data. This stage required a careful judgement to balance the data reduction. Therefore, the findings at this stage were presented to the PhD supervisors and this resulted in the repetitions and related themes been merged but with maintenance of participants' original meanings and expressions.

CHAPTER SIX

Results for Study 2

6.0 Introduction

The objectives for study 2 were informed by the findings from study 1. This study explored the perceived benefits, barriers, and motivation for downloading and using a culturally appropriate health promotion app for Black people in England, using the Health Belief Model as a theoretical framework. It also examined and explored design preferences for a culturally appropriate health promotion app for Black people in England. In addition, findings from this study helped the development of recommendations for the development, design, and implementation of a culturally appropriate health promotion app for Black people in England.

Five themes were derived from the six focus group discussions held, through a top-down coding framework using the Health Belief Model constructs to code the data as part of the analysis on NVivo. Table 18 shows a summary of these themes which are further discussed in the subsequent sections.

Table 18: Themes Derived from the Focus Group Discussions

Themes	Sub-themes
Perceived Benefits of a Culturally Appropriate Health Promotion App for Black people in England	Provide Access to Information and Healthcare
	To Address Health Needs Specific to Black People
	To Foster Trustworthiness
Motivation Towards Downloading and Using the Proposed App	The App Fulfilling its Expectations
	Informative, Credible, and Interactive Content
	Addition of Gamification Aspects to the App
Information on Illness Susceptibility and Severity, and its Relation in Prompting Action	Concerns About Credibility and Accuracy of Information on Susceptibility
	Mental Health Concerns
Perceived Barriers to Downloading and Using a Culturally Appropriate Health Promotion App for Black People in England	Accessibility
	Concerns About Data Security and Confidentiality
Perceived Ideal Culturally Appropriate App Prototype	The App Contents and User Interface
	Privacy and Security Assurance

6.1 Theme 1: Perceived Benefits of a Culturally Appropriate Health Promotion App for Black people in England

This theme explored the benefits a culturally appropriate health promotion app for Black people in England could have on the Black community. It revealed that benefits could range from providing tailored and culturally sensitive health education and

access to healthcare, to addressing the specific needs of the community, as well as fostering trust within the community. These findings are discussed in the three sub-themes below.

6.1.1 Sub-theme 1: Provide Access to Information and Healthcare

This finding suggested that some of the Black community members were aware of the need for health education for the Black community.

> *It's also great to have an app tailored to the need of Black people and I think the most important part of it (the app) would be the education. Because we do know that there are a lot of missing gaps in the education on health in the Black community. Most times because people feel uncomfortable or they feel unheard by people in the medical system. So, having an opportunity for Black people to be properly educated about the health will be great" (*Dolleh Hamham*).*

This highlights a need for more culturally tailored health education suggesting such barriers to accessing health services could otherwise be avoided if Black people had access to a culturally appropriate health education. The participant's reference of feeling unheard within the medical system is particularly significant and might either point to the broader issue of structural mistrust and, or a failure in the delivery of culturally appropriate health information to the Black community. There is a perception that even when health information was available to Black people, the source of such information was often from a perspective of people outside of the Black community, which makes its relatability to the Black people questionable.

> *"Most of what is being given to the Black people are derived from the perspective of White people, which are not ideal for us"* (Boka Hellat).

Another issue raised on this sub-theme was that the app could be helpful in improving access to healthcare information by breaking the potential barriers stigma could pose to accessing healthcare and information.

> *"I think the statistics around Black health in general and in terms of seeking help or doing research around ailments that we might have doesn't show a healthy picture. And I think having a Black health app makes it more accessible and breaks down potentially stigma around certain conditions and going to see the doctor where necessary. And it's kind of just bringing that access and raising that awareness. Because Black people tend to be more at risk of certain conditions. So, if those type of things are within the app and they can access information on that quite quickly and easily, it just makes it a lot easier for them."* (Christy Roads).
>
> *"For instance, if organisations that specifically deal with Black mental health for instance, because people don't want to go to the mainstream NHS healthcare service where they would just be written up a prescription… There's all that stigma and ideas behind mental health, so information that signposts people would be great and then videos and lots of images that actually portray Black people"* (Mayeh Aksutura).

The existence of barriers for accessing healthcare such as stigma needs addressing. The expectation is that a culturally appropriate health promotion app for Black people in England could be a suitable tool for breaking such barriers through interventions that acknowledges these barriers and address them in a culturally appropriate manner. In addition, the quotation supports a preference of culturally appropriate interventions from Black people centred organisation rather generic interventions, even if they were from credible institutions such as the NHS. Such preference could be driven by the

perceived barriers such as stigma and discrimination. Clair, Daniel, and Lamont (2016) suggested that understanding and addressing stigma from a cultural lens could foster healthcare access. A culturally appropriate health promotion app for Black people in England could therefore be a valuable tool that could not only discreetly provide tailored health education and health interventions to its users but could also empower them to break the culturally related barriers to accessing healthcare.

Moreover, the app was perceived to be of significant help to the service providers, thus nurturing their understanding of how they could best deliver interventions to the Black community.

> *"They (service providers) could use the app to inform some of the solutions to the problems in the community"* (Werguyaram Jarnaluneh).

Interventions aimed at improving health for the Black community should capture a thorough understanding of the community's needs. The proposed app was thought to be a helpful tool that could foster the service providers' understanding of the Black community, which could guide their approach to successful provision of culturally appropriate services to the community. The app could therefore be a platform for learning and understanding some of the complex issues regarding the Black community.

> *"It can be a great learning tool for health professionals to have a better understanding of the Black persons, our society, social background and differences and the importance of understanding these aspects" (Japal Mudegerr).*

The perceived healthcare providers' lack of understanding of the Black person, as highlighted in the quotation above, is one of the issues that if resolved, could potentially synergize health education within the community. A culturally appropriate health

promotion app for Black people in England was therefore perceived as an intervention that could bridge the perceived gap that exists between healthcare providers and the Black people.

6.1.2 Sub-theme 2: To Address Health Needs Specific to Black People

This sub-theme revealed that the expectation from a culturally appropriate health promotion app for Black people in England was that the app will be able to address the specific health needs of the Black community. Widely discussed among the study participants, was that the app is expected to highlight diseases and health concerns specific to Black people and provide culturally appropriate solutions to these health problems. In doing so, some participants perceived that the app could help in creating awareness of health concerns specific to the Black community. Such focus on Black people related concerns was perceived as a factor that could increase the acceptance of the app within that Black community.

> *"If it's specific to Black people, then people might use it thinking it's more tuned to topics that affect them more"* (Kate Carroll).

The quotation above indicates that the app's addressing of health concerns specific to the Black community could be a motivation for people to gain interest in using the app. This could be regarded as an important aspect of the app as some participants suggested that the app could be beneficial in raising awareness on health concerns specific to Black people.

> "*It brings access and raises awareness, because Black people tend to be more at risk of certain conditions" (*Christy Roads).

The perception that the app could create a Black community that could support each other was another finding. Discussions among the participants revealed that some Black people do not feel represented in the healthcare services and the contemporary

health apps in the market. They therefore perceived that their needs are not well represented and addressed. Moreover, the app being perceived as belonging to the Black community was thought to be beneficial in creating a supportive environment where Black people may feel they belong.

> *"...some Black related diseases are only for Black people. So, in having a (*culturally appropriate health promotion app for Black people in England)*, I would really feel that I belong more to a community than to be in any other app" (*Fagaru Moginfaju*).*

The quotation highlighted an awareness of the existence of health conditions which are specific to Black people, which is epidemiologically understood as health disparities. The last part of the quotation: "*I would really feel that I belong more to a community than to be in any other app"* signals something beyond epidemiological specificity. This instead refers to a psychological and social need for recognition, representation, and community connection. The sense of belonging here signals that the proposed app will not only provide health information to users but will also create a community where users can navigate similar health challenges within similar social context.

6.1.3 Sub-theme 3: To Foster Trustworthiness

A culturally appropriate health promotion app for Black people in England could foster trust towards interventions within the Black community. Trust emerged as a prominent theme across focus group discussions, with participants emphasising its centrality to both the acceptance and wider dissemination of the proposed app.

> "*Me personally, I think it's about how it's run. If it's run professionally then, it may potentially be more efficient and trusted than a White run app because the thought behind a Black run app is that it's actual and ethical. And you know,*

there's a real feeling of wanting to help Black people behind the app. I think sometimes with the White Man's app (contemporary app) is all about profits. It can be all about profit" (Lilly Pink).

This quotation suggests that trustworthiness, in the participant's view, is determined less by the technological features of an app and more by its perceived intent and governance. The participant drew a clear distinction between an app driven by genuine community benefit and one motivated primarily by profit, indicating that a Black-led app would be more likely to be perceived as ethical and trustworthy by its intended users. This reflects a broader pattern of mistrust towards mainstream health services and interventions. While participants expressed confidence that a culturally appropriate app could overcome such mistrust, they also identified several conditions upon which its trustworthiness would depend, including the adoption of a participatory approach, familiarity with the app's content and those running it, marketing strategies, affordability, and the overall user experience. Table 20 below summarises the key factors identified from the focus group data as likely to foster the trustworthiness of a culturally appropriate health promotion app for Black people in England.

Table 19: Key Elements that Could Foster Trustworthiness of a Culturally Appropriate Health Promotion App for Black people in England.

Key Elements that Could Foster Trustworthiness of a culturally Appropriate health promotion App for Black people in England
• The app adopting a participatory approach in its design, creation, and dissemination
• Familiarity of contents and persons running the app
• App contents that are relevant and credible
• Marketing strategies used to disseminate and maintain the smooth running of the app
• How the app is run
• The cost of downloading and using the app,
• The general experience of the app meeting its expectations

The trustworthiness of a culturally appropriate health promotion app for Black people in England could be fostered if the app adopts a participatory approach in its design and implementation. Participatory approach refers to the involvement of the intended app users in the design and implementation process of the app which could sew the spirit of ownership and foster trust. One of the participants responded to situations where projects are designed and presented to Black people without their prior knowledge and participation as follows:

> *"How can you know what is best for me? No, this intervention that did not seek my opinion is not for me" (*Christy Roads).
>
> *"It's that grassroots engagement and that grassroots word of mouth rather than being top down. It's got to come bottom-up for something like this to be embraced rather than ohh, you are sort of targeted and therefore it's for you"* (Kate Carroll).

These quotations articulate a fundamental principle of equitable health intervention design, that trustworthiness requires genuine participation in all stages of health app development (Müller et al., 2023). The participants therefore rejected the top-down approach (Beatties, 1991) where experts decide on what is best for people without due consultation and participation as seen in the contemporary health app industry. Therefore, Beattie's (1991) community development approach, which empowers people to take responsibility over their health, thereby fostering community participation in health inventions, could be the right approach to foster the trustworthiness of the proposed health app. Adopting a participatory approach could reveal some useful design aspects that could otherwise be left out (Aryana and Brewster, 2019).

Familiarity was another factor that this study showed could foster the trustworthiness of the culturally appropriate health promotion app for Black people in England. Familiarity here refers to the app having a function that could allow the expected users to interact with people who look like them, and as well as getting users connected to providers who might understand the social and cultural factors that may affect their health.

> *"…with the app, I'm going to see a Black doctor or service provider knowing that they may understand that as much as I want to do exercise, I may have to work three jobs, I have three kids;… and there're other variables that they (people with experience dealing Black peoples' concern) may be more aware of as compared to the general population"* (Mayeh Aksutura).

The quotation refers to the importance of health service providers' understanding of the social contexts surrounding the people they serve. This suggests that the app could be useful in connecting users to health practitioners who might be well equipped with

knowledge and experience of the context of the Black community. Torres (2018) suggested that Black people being seen and attended to by Black doctors could lead to more acceptances of preventative interventions even when they were invasive than if they were attended by White doctors. The participant also illuminates a failure to account for social determinants and structural constraints shaping health behaviours. Generic health advice such as ‘exercise regularly’ ignores lived realities of Black people navigating multiple structural inequalities such as economic precarity and caregiving. A Black provider or culturally aware service would recognize these structural constraints and offer holistic support rather than individualistic blame. The expectation for a culturally appropriate health promotion app for Black people in England is to embed structural awareness recognising that health behaviour is constrained socioeconomic factors and not merely individual motivation.

Moreover, the highlighted understanding of the health benefits of exercising coupled with demonstrated willingness to do exercise but unable to perform it, reflects that circumstances might have forced them to choose between exercising and socioeconomic commitments such as working longer hours, which might be essential to her survival. This analogy is a common experience for many Black people within the community as many may have to choose between putting themselves in harm's way to earn a living or remaining in destitution for not doing so. Blundell et al. (2020) which showed that when Covid-19 lockdown rules were in place, Black people were more likely to be in employment that did not allow a chance of working from home, which was a measure put forward by the UK government to curb the covid-19 infection rate. This therefore increased their risk of contracting the virus. In fact, Blundell et al. (2020) showed that Black people were more likely to work as key workers than any other race. Key worker was the term used during the covid-19 pandemic to describe those whose

services were vital to the country and could not work from home and were therefore allowed to travel to work during the covid-19 lockdown period. As well as the health risk, working as key workers had a social and economic linkage as Blundell et al. (2020) showed that key workers were more likely to be on lower wages, with Black people having a higher representation of being a key worker than any other race. Therefore, as evidenced in the quotation above, a culturally appropriate health promotion app for Black people was perceived to be beneficial in providing a linkage between users and service providers who might understand the social and cultural factors that may affect Black peoples' health and are able to deal with them holistically. This could foster trust between services providers and the Black community.

Another aspect of familiarity as a factor of a culturally appropriate health promotion app for Black people in England, which could foster trust in the Black community is the notion that the app belongs to and is designed Black people.

> *"I think if it's a Black peoples' app, and it's owned by Black people, we're going to feel more of a relationship with it than an app owned by White people"* (Yorkuteh Akjama).

If the intended App users trust the people commissioning the app, they are more likely to download and use that app (Nurgalieva et al., 2023). Having a service delivered to the Black community by a Black person could be a trust fostering element. The Black community may consider that the Black person commissioning the proposed app may have an understanding and first-hand experience of the complex social and economic challenges that exist within the community. Therefore, trust of the culturally appropriate health promotion app for Black people in England could be fostered if users were to be aware that the app was designed and commissioned by people from within the Black community.

Another aspect of the culturally appropriate health promotion app for Black people in England that could foster trust within the Black community is the app's consistently providing contents that represents the needs of the Black people. Trust could be built for the app if the users could easily relate to its contents. App contents that are focused on the needs and requirements of the expected users could have more impact in fostering trust in the Black community, than the app custodians being from within the Black community.

> *"So basically, just like any other app or any other thing that's launched; I think the ability for the app to be trust would have to be demonstrated over time. The credibility of information that it is providing, and how important or relevant is it to the people it is targeting generally. Because people might not necessarily know who is actually running the app, but if it is giving them what it intended to give and to the right audience, then I think it will be trusted"*
>
> *(*Bulragal Tuss).

Even though the ethnicity of the proposed app's custodians could play a role in fostering trust, the app contents could be an important factor that the expected app users could independently use to weigh how trustworthy the app may be. Therefore, care must be taken when designing the culturally appropriate health promotion app for Black people in England as the relevance of its content may depend on who the expected audiences are. This supports the *'Transparency for Trust Principles,'* which suggested that health apps are better trusted if users are given information on their expected benefits before downloading them (Wykes and Schueller, 2019). For some participants, the importance of credibility of information in the proposed app could outweigh the ethnicity of the custodians of the app in fostering trust.

"I'm not too worried about whether it's Black or White person running the app. For me it is about how credible those authors would be, because for me it's about credibility" (Defal Lubah).

The marketing strategies used to disseminate the proposed app and its services to the Black community could also affect the trustworthiness of the app. Even though marketing could help disseminate the app to wider audiences and as well disseminate information within the app, if it is not done in a culturally appropriate way, it could affect the app's perceived trustworthiness.

"The fact that the app has been on the market or maybe the app has been on a trend for a while… for me, my ability to trust it would be derived from the fact that I am probably be aware of the app and its relevance or maybe the benefits I can get from it" (Yorkuteh Akjama)

The quotation supports that good marketing could foster trust and wider dissemination of the proposed app. However, inappropriate marketing strategies or messages could equally hamper the perceived trustworthiness of the app and deter Black people from downloading and using it.

"If they were marketing the app in a way that gently invites me to use it without mentioning that I was a Black person, but actually talking about issues that I experience, or that which I was bound to experience as a Black person, I would be more geared towards using it immediately. I would be more interested in something that was reaching out to me without actually labelling me" (Jeff Giss).

Marketing that app with a message that might be perceived as segregating the Black community from the rest of the population could ultimately affect the perceived trustworthiness of the proposed app. Therefore, even though marketing is an important

factor in disseminating the app to wider audience, it could pose as a barrier for accessing the app if its strategy and language are not well crafted and culturally appropriate to avoid being perceived as segregation of the Black community from the rest of the populace.

Even when well-crafted and culturally appropriate in its contents the marketing strategy should be sensitive enough not to cause any form of discomfort. One of the participants mentioned that she does not trust any app that is *"too choky."* The word 'choky' was used several times, referring to some of the contemporary apps in the market that constantly ask users to engage in some form of activity or services offered within the apps or as web links outside the apps.

Another issue referred to, was the avoidance of *'obnoxious'* advertisements, where the app may constantly try to convince users to join or participate in certain activities, even when users show no interest in them. If a culturally appropriate health promotion app for Black people in England is to use advertisements, it will be best to tailor them according to interests and limit the frequency at which these adverts are delivered to users, as the notion of the app being choky could raise a concern over its trustworthiness.

> *"…virus like malware and I don't know if that is what it's called, obnoxious adverts, so it keeps popping up. I don't like when advert pops up. I don't even like to use it but they keep popping up. So, it's really, really annoying."* (Dolleh Hamham)

Black people might not entirely dislike advertisements, and it might not as well be a deterrent to using or trusting the app, if administered judiciously keeping in mind that advert preferences within the Black community might be diverse and worth exploring.

> *“So even if the advert is going to come up, it should be a food kind of adverts, or maybe like a music advert… but clothes, clothing online from www... I don't like it, it's so annoying. I know most people don't even like to watch YouTube because the advert is so continuous. if there's going to be an advert, I think it should be after some time, maybe you've used it (the app) for some hours, then it pops up, then we would maybe get used to it. But (for the advert) to be frequently on my screen, I don't like it.* (Dolleh Hamham)

The issue around whether a culturally appropriate health promotion app for Black people in England should ask users to pay for access or not, was a well debated topic among the study participants in most of the focus group discussions. Those in favour of the app not asking for any monetary gain from users made a claim that if the intentions of the app creators were for helping the Black community, then there should not be any monetary gain for their services to the community. However, many of the participants acknowledged that maintenance and smooth running of the app may require funds, and therefore will not mind paying a one-off payment to access the app.

> *“if it was a one-time payment that was reasonable, I wouldn't mind. But then if it was something to add to your already expensive life and if it wasn't exactly life saving for me as a person, then I don't think I would continue with it”* (Dolleh Hamham).

From this quotation, it could be said that that some participants might pay for accessing the app if the app could offer them their expectations. However, such cost should not be a regular or ongoing one as this may deter some users from accessing the app.

6.2 Theme 2: Motivation Towards Downloading and Using the Proposed App

Motivation as used in this theme is defined as a *“desire or want that energises and directs goal-oriented behaviour”* Huitt (2011). It is therefore a goal-oriented behaviour

aimed at maintaining health and wellbeing (Rosenstock, 1974) as used in the Health Belief Model which informed the constructs of this study. It is used in this theme to explore participants' interest and likelihood of downloading and using the proposed culturally appropriate health promotion app for Black people in England. The theme explored some of the key factors that could motivate participants to download and continue using the proposed app and the findings are discussed in the three sub-themes below.

6.2.1 Sub-theme 1: The Proposed App Fulfilling its Expectations

For the proposed culturally appropriate health promotion app for Black people in England to succeed in being downloaded and be consistently used, it must satisfy some or all the expectations the users might have expected from it when they opted to download it.

> *"Well, I think if it's serving purpose, because we download an app to find it useful or maybe, it's serving its purpose. So, if I download a health app and It's giving me all the information that I need or that I'm looking for then definitely I'll say it served its purpose, but if not, I'm so quick at deleting apps from my phone. That's the easiest I can do, and off you go... because they take space, isn't it? You know, they take so much space. So why there, if you're not serving your purpose"* (Anda Ligueye).

The quotation suggests that some people are likely are likely to have preset expectation from a health app they are looking to download and use and if such expectations are not met, the app is unlikely to be kept in their phone. It also highlights relevance of the app as one of the reasons for the app to survive the limited space competition with other apps on the users' phone. This is supported by McCurdie et al (2012), which suggested that apps that do not satisfy the expectations of users the first

time are less likely to remain active on users' phone. For some users, motivation to stay active on the app could be achieved by not only meeting their expectations but also offering something extra that might attract their interest.

> *"..I will continue to use it if it is meeting my expectations and exceeding them probably. If I downloaded it because it was recommended that I would find ABC and D, and then I find ABC and D and probably find F too, then I will stick to the app and continue using it"* (Blake Stark).

The key to sustained health app engagement is delivering and exceeding promised value. The participant articulates a transactional logic that sustained use of the app depends on trusted recommendation and as well as specific expectations being met. The proposed app is therefore unlikely to stay on the expected users' smartphones unless it fulfils their expectations and or offer them contents and services that they deem relevant.

> *"If it's relevant and stays relevant, I will keep using it. And I think there's various practical factors to that. It could be relevant in terms of getting what I want from it, it meets the purpose that I intended to get from it. Also, if there isn't a better option, I will continue to use it*" (Jeff Giss).

Sustained relevance is one of the key drivers of long-term retention of the proposed app. The relevance referred to in the quotation as an element of sustained use is not a one-off requirement, but instead the app must stay relevant to its users. This suggest that the proposed app's success depends on continuous alignment with user need and competitive positioning. Failure of such sustained usefulness risk the app's replacement should there be any other app that users could have access to.

6.2.2 Sub-theme 2: Informative, Credible, and Interactive Content

This sub-theme highlights the importance of app contents as a motivation towards downloading and using the proposed culturally appropriate health promotion app for Black people in England. Discussions from participants on this sub-theme revealed that for motivation towards downloading and sustained use of the proposed app, the app contents must be informative, credible, and interactive. These three motivational factors regarding the contents of a culturally appropriate health promotion app for Black people in England are further discussed below.

6.2.2.1 Informative contents:

Being informative is not limited to the app providing useful health information only but it also extends to the app featuring breakthrough interventions and findings that are of specific interest to the Black community.

> *"For me, it's just basically two things, and firstly just constant updates on new findings. Ideally, I'd like to have a section on the app that says, this sort of groundbreaking research on Black people, and on this health condition that only affects Black people. Maybe for example, like what is happening around the Black people's health as well?"* (Pateh Ngom).

The quotation highlights the importance of regular updates of the information that might be accessed through the proposed app. This does suggest that providing relevant information only, might not be enough to keep users engaged over time as such information may need to be reviewed and updated, as necessary. The quotation also highlights the importance of keeping a focus on Black people and around issues relevant to the Black community as discussed in earlier sections.

Even though it could be challenging to deliver scientific information for general consumption without the language being too technical (Gonzales, 2019), some participants emphasised the importance of using *'casual'* language to deliver

information contents while making them more accessible to the Black community. Casual language here refers to a simplified language that is non-technical or academic and could be easily understood by the Black community.

> *"I like information presented in a relatively casual manner such that you don't feel like you're reading the newspaper or something like that"* (Terehmutey Bayimugis).
>
> *"There is a guy on Instagram, he does like literally a 30 minute or one minute skit where he's talking about a serious health problem. But he adds humour to it, and he makes you aware that it's very important that you need to focus on these things and he will sort of explain some of the terms without making it sound too academic. But he gets the message across"* (Mayeh Aksutura).

The second quotation above demonstrates the possibility of making seemingly complex contents or information accessible and therefore making it informative to the Black community. This is a factor that could motivate users to continue engaging with the proposed app. Given the complexity of the Black community in terms of language and culture, it is imperative that a culturally appropriate health promotion app for Black people in England uses an all-inclusive language to communicate its contents to users. Even where an app content may be deemed useful and appropriate for expected users, if the language used to transmit the content is too complex to for users' consumption, they will less likely be inclined towards the app (Claudy et al., 2014; Sinha Deb et al., 2018).

6.2.2.2 Interactive contents:

The app offering contents that allows some form of interaction among the users was another app content that the participants perceived could be a motivating factor towards downloading and using the culturally appropriate health promotion app for Black people in England. Interactive contents here refer to app contents that allow

users to interact within themselves or with a service provider within the app. These could include group chats and specific community networks, to which users could subscribe to.

> *"A community (a chat group within the app) where people can interact ...and can speak up, …that can make me continue using an app"* (Terehmutey Bayimugis).

This participant highlighted that having such facilities within the app could influence people to 'speak up.' Speaking up here referred to breaking barriers of communication and sharing experiences that could be beneficial to the Black community. Another participant was quoted below proposing community network services within the app, which could be useful to the Black community.

> *"A section in the app where approved community-focussed groups may have a section there… and then they're updating in there"* (Kate Carroll).

In the quotations above, the participants referred to online community networks and chat groups where users could feel safe and free to share their experiences and learn from other users as well. Offering health app users, a chance to connect with other users could motivate them to engage in health improving behaviours (Gui et al., 2017).

6.2.2.3 Credible contents:

Another motivation factor regarding the contents of a culturally appropriate health promotion app for Black people in England was the credibility of the data source. Some participants highted the need for verifiable contents drawing upon factors such as the credibility of the providers of the contents and whether such contents are verifiable and could be trusted.

> *I want to look at those people whose names are there (on the app), what have they done? Do I have that confidence in them? So it's whether that sources of*

information can be trusted or not. How credible are those authors? That's what give people the confidence gets into the app" (Defal Lubah).

The data source is therefore an important factor in determining how motivated users may be in downloading and using the app. It is therefore prudent that contents of the app be backed by science in order to motivate more people towards its download and use. On the other hand, Biviji et al., (2020) suggested that data that are not from credible source could be a demotivation factor towards downloading and using health apps. This also surfaced in one of the focus group discussions.

"It depends on where the people managing the app are getting the data from, because if the app is not based on science, then, it cannot be trusted."

This participant associated trust with credibility of data which implies that if a user perceives an app content might be unreliable, they might perceive the app as untrustworthy, which in turn could motivate them not to download and use the app. Moreover, the experience with the contemporary health apps seemed to be that of providing unreliable information.

"…sometimes you have an app for walking which continues to count your steps even if you're still sleeping" (Zach Barrett).

A culturally appropriate health promotion app for Black people in England is therefore expected to address the needs of the Black community with interventions not only designed and tailored to the Black community, but accurate and specific to the Black people.

6.2.3 Sub-theme 3: Addition of Gamification Aspects to the Proposed App

This sub-theme explored participants' interest and experience in using gamified health app and as well as the acceptance of the addition of gamification to the culturally Appropriate health promotion app for Black people in England. Gamification is the

"application of gameful elements for non-game purposes" (Cheng et al., 2019). In general, gamification of the proposed app was welcomed by most participants. However, the term gamification appeared new to many of the participants, and therefore an explanation was required by several participants.

> "*We may not actually know we like those gamification aspects of apps. We may not know about it" (Bulragal Tuss).*

Some of the participants were not sure if this was a feature that should be added to the proposed app. For them, a health app should be free from gamified features which could pose as a distraction to accessing important health related information.

> *"I think it depends on what the app is about, so if it's for the health, I wouldn't expect to find any games on it or anything like that. If it's something quite serious, I would expect it to be just focused on what it is about. Not having other things that kind of deviate you from the main purpose"* (Outay Dunyawo).

Despite the limitation of not knowing what gamification was, some participants could recall having used gamified apps once they understood what was meant by the term. Many of them therefore shared detailed accounts of their experiences using apps with gamification elements.

> *"Duolingo for example, is a language app that I have used and still have it on my phone. It made the experience of learning language a lot more fun and interesting"* (Dolleh Hamham).

An important element to note from the quotation above is that the participant mentioned that she still had the app in her phone. This could mean that gamification could contribute to the continual use of the proposed app, which is one of the measures of an app's fulfilment of its users' expectation and as discussed earlier sections, apps that fail to meet this criterion may end up being deleted from users' phones (McCurdie

et al., 2012). Another important element that can be deduced from the quotation is that the participant described the learning of new language through a gamified app as 'fun and interesting.' This gamification aspect of the app could be a motivating factor that could encourage users to engage in activities within the app that they might not normally get involved in. A user might engage with a gamified app content for the purpose of fun and then get to benefit from or engage in a desired behaviour in the process. Lee et al. (2017) suggested that apps with gamification aspects could be an effective way of encouraging unhealthy people and as well as healthy people who might feel they do not need to engage in healthy behaviour, to be motivated towards a desired health improvement and health maintaining behaviour. However, the addition of gamification to a health app is not a guarantee for sustained engagement with health interventions in the app (Cugelman, 2013). Even though it is an effective way of adding fun to users' experience, this does not mean fun directly translate to an increment in the motivation to engage in a desired behaviour (Rigby, 2015). The use of gamification in the proposed app should be geared towards augmenting factors that influence engagement rather than being applied as an independent app engagement motivation factor. Therefore, one of the aspects of gamification that could add value to the proposed app is progress tracking.

> *"It's not just going on there to access information or tips, it's to do with (tracking) my progress. It's about an effort I've made and what that it's progressing me forward to"* (Christy Roads).

The quotation from the participant above stressed on the importance of apps not only focussing on the provision of information, but to as well enable users to visualise the results of their input. The participant's account could justify the disposition that gamification could help users visualise the outcome of their sacrifices through the

tracking and showing of their progress in activities they may participate in within the app. This could offer users an opportunity to measure how much more they need to do to achieve or maintain a goal. The use of goal setting in gamified health apps is well documented and could be a useful asset in health behavioural change (Edwards et al., 2016; Rajani et al., 2019).

Some of them believed that gamification is meant for younger people and therefore if it was to be added to the proposed app, this should be in a separate section accessible to young people, rather than being generally available to all users. One such participant was quoted as saying:

> *"If you were putting the gamification content on the side for kids or younger people to engage with, that would be great"* (Mayeh Aksutura).
>
> *"I think it all depends on what your target audience is, because I'm 30, people my age group and younger, some of us do have short attention spans. So we are interested in the actual knowledge but sometimes having that fun element can get the right balance between the knowledge and the fun. But it all depends on you as a person" I guess* (Lilly Pink)
>
> "*I think it will encourage engagement because obviously that (gamification) won't be that only thing. There will be gamification and other things. So, people that want that, especially the young Black community.. they will find that very interesting. It may increase engagement to that young audience. Maybe not for the much older audience, but I'm thinking about my young self, I will find that very engaging"* (Caitlyn Baker)

The quotations above suggest that older people might not be interested in gamified interventions. However, these views are from younger participants who believe that gamification might not be welcomed by the older generation. This view was different

from findings from Koivisto and Malik (2020), a systematic review which demonstrated that most studies that tested gamification on the 55 years and above yielded positive findings that suggested its feasibility in this age group. Altmeyer, Lessel, and Krüger (2018) also showed that people aged 75 years and above were found be more inclined to health apps with gamification for the purpose of socialisation rather competition. In this PhD study, many participants within the older age group did express their interest in a gamified health promotion app for Black people in England. One of such participants gave a detailed account of how a gamified smoking app helped him stop smoking and went further explaining how the app continues to make follow-ups and motivate him to maintain the smoking cessation.

> *"Can I give you another example? I quit smoking not very long ago, and I've been doing so for a long time. So, when I quit, I downloaded an app which goes through the quitting process with me and challenges me, and tells me hey, an applause every day that I haven't smoked. And we're going years now.... and it says, hey, you've been six months, you know..., have you had any cravings? So I'm challenged..., it's like playing a game with my ego"* (Jeff Giss)
>
> *I'll be more inclined to use it (the app) if I can just get the information I need and go, instead of going through those elements… that gamification*" (Brice Turner).

Findings from this sub-theme suggest that people may think they do not like gamification in health app because they may not understand what gamification really is. Moreover, owing to the notion that anything concerning health must be a serious matter, people may perceive that the addition of gamification to health app may deviate focus on the health matters, which is not always the case, as findings in this sub-theme suggest that gamification of the culturally appropriate health promotion app for Black people in England could be a good motivation factor towards a behavioural change. It

is therefore evidence from this study that gamification could have strong potential in increasing the success rate of health interventions through smartphone apps. Even though many users may engage with, and enjoy gamified apps without knowing, it is vital for app designers to consider their intended users, as age may influence the choice of gamified apps users may engage with.

6.3 Theme 3: Information on Illness Susceptibility and Severity, and its Relation to Prompting Action

This theme explored the belief of participants and how they would react to the proposed app providing users with information on their risk of developing a specific illness or to information on the severity of specific illnesses to which they might be susceptible. Generally, most participants wanted to know such information. However, there were several concerns raised as detailed in the sub-themes below.

6.3.1 Sub-theme 1: Concerns About Credibility and Accuracy of the Information on Susceptibility

The app's accuracy in giving feedback to users on their susceptibility to specific illnesses was one of the major concerns raised. Inaccuracy of the information on the user's susceptibility to a particular health concern could be because of the user not inputting the required data to the app accurately. One of the participants was quoted as saying:

> *But it will depend on how accurate this information will be, because we call things differently and if we do not have the right words for the words we are inputting to the app, then it (the app) could give us the wrong thing, and then we start panicking* (Caitlyn Baker)

The participant's account is in reference to the diversity of the Black community in terms of culture and language. The focus group interview this participant participated in was mainly made up of Black Africans from different cultural backgrounds. One of

them gave an example of how some statements that might appear simple and easy to understand could have an entirely different meaning. An example is *"my stomach is paining,"* which could mean *"I am menstruating"* if said by a childbearing aged woman.

Concerns about health apps' accuracy in testing what they are expected to test is well documented (Krebs and Duncan, 2015; Naughton et al., 2016; Vaghefi and Tulu, 2019). Even though health apps have been found effective in assessing symptoms, their reliance on accuracy, safety, and coverage do not make them a good replacement for general practitioners (Gilbert et al., 2020). This however does not imply that Black people always believe in the accuracy of their general practitioners. Instead, there seems to be some degree of mistrust for the GPs based on the experience shared by some participants. One of such participants was quoted as saying:

> *"I don't know how accurate that information from the app would be, because not once or twice have we seen scenarios where someone (the GP) sees you or maybe you're behaving a certain way and then being misdiagnosed for something"* (Bulragal Tuss).

The participant correlates some experiences of not having a right diagnosis from GP consultations to the possibility of the culturally appropriate health promotion app for Black people in England following a similar trend. From the perspective of this participant, if GPs could be questioned for their accuracy in diagnosing Black peoples' ailments, then it is likely that the proposed app could follow the same pattern.

This sub-theme therefore suggest that Black people may welcome the idea of having the proposed app inform them about their susceptibility of specific health concerns. However, for this to be realistic the app must overcome the challenges of cultural and

language barriers within the Black community, and as well as maintain accuracy in all its endeavours.

6.3.2 Sub-theme 2: Mental health concerns

This sub-theme revealed that the proposed app providing users with information on their risk of developing a specific illness or the severity of such illnesses to which they might be susceptible to, could raise mental health concerns. Some participants echoed that mental health was already a big concern within the Black community, and therefore adding such function to the proposed app could worsen the mental health burden facing the community.

> *"That (such information) could add some anxiety there, because getting access is not the greatest when you have something quite particular as it (mental health) is"* (Kate Carroll)

The participant's account highlights that such information could raise anxiety among the proposed app users, which is one of the symptoms of acute mental health concerns (Mangione et al., 2022). Moreover, the quotation is a pointer to the possibility of existence of challenges regarding access to mental health services within the Black community. Also, concern was raised over possibility of such information creating a dilemma of not knowing what to do or accessing immediate care after knowing one's susceptibility to a health threat.

> *"It's great that you give me my risk factors, or my susceptibility to the illness but if you're not going to give me any information on what to do about it, then I don't want to know"* (Mayeh Aksutura).

The quotation above disclosed that some people might prefer not to know their susceptibility to specific health concern if treatment or solution is not readily accessible to them. In contrast, the focus of the proposed app should be on promoting general

wellbeing rather than focussing on diagnosing users of health conditions that might lack accessible solutions.

> *"I think if it (the app) is focused more on how you could improve your outcomes (health) rather than telling you your susceptibilities to these conditions and then raising alarm bells"* (Christy Roads).

A concern highlighted in the quotation above the possibility of such information *'raising alarm bells'* which could mean '*causing avoidable anxiety.'* The participant quoted here rather referred to a shift towards a salutogenic approach to health promotion for Black people, which is a focus on what causes wellbeing rather than what causes ill health (Mittelmark and Bauer, 2022).

This sub-theme suggest that the participants might embrace the proposed app's informing users about their susceptibility to and the severity of specific illnesses, if there were reliable mechanisms in place to curb the possible mental health impact and access to healthcare that might be needed. Therefore, it might be better to segregate this information from other areas of the app for those interested in such app feature, rather than making it general for everyone or leaving it out entirely which will likely disappoint all of the people who want this type of information.

6.4 Theme 4: Perceived Barriers to Downloading and Using the culturally Appropriate health promotion App for Black People in England

This theme explored the perceived barriers of downloading and using the proposed culturally appropriate health promotion app for Black people in England. Findings under this theme were accessibility, as well as data security and confidentiality related concerns. These are discussed in the two sub-themes below:

6.4.1 Sub-theme 1: Accessibility

Accessibility as discussed in this sub-theme refers to how easy it is for the app users to maximally benefit from the app, through successful navigation within the app to sections they might be interested in. This sub-theme highlighted some of the perceived accessibility concerns that could pose as barriers to accessing the proposed app. Each of these concerns are discussed separately below:

6.4.1.1 App not using simple Language

Language as a concern for the proposed app to accurately give its users feedback on their susceptibility to specific illnesses was discussed in earlier section. It is discussed in this sub-theme as a barrier to downloading and using the proposed app. A key finding was that there was an awareness of the limitation of language within the Back community. Some members of the community are limited in terms English language, and therefore, unless the app uses a simplified language or instructions, its use within the community will be limited. This therefore indicates that many of the Black community members may not have access to contemporary health apps in the market due to language limitations in these apps.

> *"There's a limitation in terms of language... So, the app has to be very simple for everyone to maximize the use of it*" (Pateh Ngom).
>
> *"It's about accessibility to the services. But unique accessibility or specific accessibility, because the Black people have been marginalised. We don't have equal access to most of the services, maybe because of some barriers, let's say language, or race or colour. So maybe an app is something that is going to increase the Black community access to a medical facility, for instance"* (Blake Stark).
>
> *"It also depends on the language that is going to be used, what options of the language is in the app itself"* (Dane Leo).

The quotations above recognise that some members of the Black community particularly recent immigrants and those for whom English is not a first language might face linguistic obstacles to accessing mainstream healthcare and services. This places a culturally appropriate health promotion app in a position to offer multilingual contents and support. An alternative could be a deliberately simple design that accommodates diverse language proficiencies and literacy levels. This would mean using plain language with minimal jargon, reflecting the principle that good accessible design may benefit everyone.

6.4.1.2 App Costing the Users Money

Cost was discussed as an element of trustworthiness in sub-theme 3 of theme 1. In this section, it is addressed as an accessibility issue that was widely debated over by the participants during the focus group interviews. Even though many participants were cited as saying they would not mind making a one-off payment for an app that they might perceive useful, there were several participants who argued that if the app or intervention was intended for the benefit of the Black community, it should not indulge in any profitable gain financially. Therefore, some participants perceived it a barrier if there was an amount of money to be paid before accessing the app. One such participant was quoted as saying:

> *"I'll use an app which doesn't have a business attached to it, and not one where they'll say they're giving but instead, they want to take"* (Zach Barrett).
>
> *"with an assumption that somewhere down the line, there might be a charge, whereas you just try and look for stuff that isn't gonna cost you anything. Why would you wanna do that (pay for app) unless it's really targeted to your interest*" (Kate Carroll).

It can be deduced from the quotations above that if access the proposed app was to attract a fee from the users, this could pose as a deterrent from downloading and using

the app. Such barrier might be overcome if the users perceive a usefulness on the app that they might not find anyway else for less and are able to and willing to pay for such cost. Joe et at. (2021), indicates that users are likely to perceive health apps that requires payment as less credible than the free access ones. Even if people were to try the proposed app and were happy to continue using it, cost could pose as barrier to continued usage if it was to be introduced at any point.

> *"That it (the app) keeps staying free, because I don't want to have gotten used to it, and then 6-8 months down the line, they (the app custodians) bring up this idea of paying for the membership of some sort"* (Dolleh Hamham).

It is likely that some users will not pay for access of culturally appropriate health promotion app for Black people in England, even after experiencing its usefulness. Another participant who thought a culturally appropriate health promotion app for Black people in England must stay free was quoted below:

> *"There's no way I'm going to pay for your app over everyone else's when they offer the same thing"* (Yorkuteh Akjama).

The quotation above suggests that for some users to pay for the proposed app, there must be something unique about the it that is not readily accessible in the contemporary apps on the market. The perception of this participant is that a culturally appropriate health promotion app for Black people in England might be like any other health app available in the app market for free, and therefore there should be a justification for any monetary attachment to the app.

6.4.1.3 Digital Poverty and Literacy

Digital poverty was another factor that came up as a perceived barrier to accessing a culturally appropriate health promotion app for Black people in England.

> *"The unavailability of devices that the app will be installed in, …because not everyone has a smartphone in the Black community"* (Sam Barron).

Not having access to smartphones could as well mean a limitation of knowledge on what a smartphone could do. Therefore, those Black people who do not have access to smartphones may as well not be able to use one, which may limit their access to the app even if they were to be provided with a smartphone. This means that if there was to be an intervention aimed at providing Black people with smartphone devices, it should as well be accompanied by a digital literacy program. Otherwise, the success of such intervention in improving access to the app use could be questionable.

> *"There's a lot of digital poverty within the community, where people just want to do the basics of maybe Facebook, WhatsApp, and Email, and outside of that, you'd have to run a whole course to teach them what to do with the app"* (Mayeh Aksutura).

The participant appeared to be referring to a reluctance of some members of the Black community in embracing new technologies such as health app. This might not necessarily be a reluctance, but instead a not knowing or experiencing the benefits of such health apps. Therefore, digital poverty in such populations could be reduced by educating people on some of benefits that a culturally appropriate health promotion app for Black people in England could bring that might not be found on other platforms.

6.4.1.4 Using a Complicated Interface

Simplicity was one of the key words echoed by participants when they discussed app interface during the focus group interviews. Many participants cited the app interface as one of the key factors that could make them lose interest in an app. Therefore, an app that is user-friendly in terms of its interface is more likely to keep its users than a complicated one. A participant was quoted as saying:

> *"It depends on how complicated the interface is, if it's something that's really friendly, something simple, something that you can easily navigate, I'll be more likely to use it"* (Vickie Wallace).

The participant cited some of the key factors that could make an app interface user-friendly. One such factor is the effectiveness and ease of navigating from one point to another within the app, without getting lost in the app or losing interest during the process. The proposed app could use signage and other communication elements that could ease the use of complex interface to communicate to its users.

> *"I think one area that needs to be so obvious is usability. How easy is it to achieve your goals, how complex is it to achieve something that you want to do. You have an end goal in mind, how clear is it to get from A to B through the app"* (Jeff Giss)

For some participants, such as the ones quoted above, an accessible app interface is a key factor that could influence their use of the app. This is particularly important to consider if the proposed app is to target the general Black community.

6.4.2 Sub-theme 2: Concerns About Data Security and Confidentiality

This sub-theme explored participants' views on data security and confidentiality as barriers to downloading and using the culturally appropriate health promotion app for Black people in England. One of the key findings was not having a clear statement of data protection and as well as protecting users' data. Most participants highlighted concerns over not being aware of how much of protection is given to their personal data when they access apps, with uncertainty over possible data access by third parties.

> *"Anybody can have access to your data and then take advantage of it. So, for me I think I worry a little bit about that"* (Werguyaram Jarnaluneh).
>
> *"I hate it, because the moment you click on certain apps, the next minute, you see advert on your page. When you go on to Facebook or somewhere, you get*

all this (adverts). It's so scary because you know what they're doing to information. So, you gotta be a bit careful" (Kate Carroll)

The quotations from these participants highlighted the sentiments many participants had concerning data safety. There was concern over information safety in some of the apps the users might have used. Even if an app is naturally considered safe and protects users' data, the lack of users' awareness of the safety measures for their protection in such app alone could be a barrier that could limit access to the app. Data safety concerns could therefore hinder access to the culturally appropriate health promotion app for Black people in England, which means that users that share the same sentiments as the ones quoted above might not use an app unless the perceived benefits outweigh the data security concerns. Therefore, for a culturally appropriate health promotion app for Black people in England to remain accessible, it must address these concerns, and one of the ways suggested by a participant was the app's providing information to users on what measures are taken to ensure data safety and security are observed.

6.5 Theme 5: Perceived Ideal Culturally Appropriate App Prototype

This theme discusses the drawings from the focus group participants detailing a depiction of their perceptions of a culturally appropriate app for health promotion for Black people in Egland. The analysis of the drawings from the participants was done following the guidance on analysis and interpretation of participant-generated images described in Guillemin and Drew (2010). The findings under this theme are discussed in the two sections below: the app contents and user interface, and privacy and security assurance.

6.5.1 The App Contents and User Interface

The drawing from the participants suggested a unanimous desire for app contents that are easy to navigate through. This was indicated by a clear demarcation of contents such that users can access the information they might require with the utmost ease possible. Some participants (see Appendix 3.2, Image AP1, Image AP2 Image AP3, Image AP4, and Image AP7) added more clarity and context to such demarcation, with their drawings showing content divisions into sections such as physical health, mental health, and dietary and weight related contents. The drawings from the participants also evidenced a desire for accessing personal support through the proposed health app. Such support ranged from search engines, access to service providers such GP access, and a forum for virtual interactions.

Imagery is another factor that was deemed important as evidenced in Image AP4, Image AP5, and Image AP6 (see Appendix 3.2). Although this was discussed in earlier themes, using images and themes that represent the Black people is something that could create familiarity of the app and its connection with the expected app users. It is therefore necessary that the images used in the proposed app are those that Black people could resonate with.

Special emphasis was placed on user interface that allowed users to easily navigate between app contents. This was evident in all the prototype drawings but Image AP5 and Image AP8 (see Appendix 3.2, Image AP5, and Image AP8) went a bit further suggesting a complete separation and labelling of contents that could allow users to easily access contents they might be interested in. So was the idea from Image AP4 (see Appendix 3.2, Image AP4) which suggested a clear demarcation according to age, making age-appropriate contents directed to specific age groups.

6.5.2 Privacy and Security Assurance

Data security and confidentiality was discussed in an earlier section as one of the perceived barriers to downloading and using a culturally appropriate app for Black people. This sub-theme explored how the users depicted the proposed users' privacy and security assurances in their prototype drawings. The most depicted security assurance was the use of username and password to access that app. This was depicted in Image AP2, Image AP4, and Image AP6 (see Appendix 3.2), which suggested the creation of user accounts for new users to access the app. Clarity on data security assurance was especially depicted in Image AP7, where the participant depicted a desire for assurance of the proposed app's compliance with the GDPR and to make such information available to users.

6.6 Discussion of Main Findings

4.6.1 Overview

This qualitative study explored the perception of Black people in England regarding a culturally appropriate health promotion app, with particular focus on perceived benefits, perceived barriers, perceived motivations, and app design preferences. The findings from the eight focus groups discussions revealed complex insights that both align with and extend existing theoretical frameworks, particularly the Health Belief Model and user-centred design principles. This discussion interprets the study's five main themes in relation to current literature on digital health equity, cultural competency in health technology, and participatory design approaches.

4.6.2 Perceived Benefits: Addressing Health Inequalities Through Culturally Tailored Technology

The findings demonstrated that participants recognised multiple benefits of a culturally appropriate health promotion app, primarily focussing on improved access to information, addressing Black people specific health needs, and fostering trust. These

perceived benefits align strongly with the HBM constructs of perceived benefits, which suggests that individuals are more likely to engage in health behaviours when they believe the benefits outweigh the costs (Rosenstock, 1974). Participants articulated clear expectations that the health promotion app would provide tailored health education that addresses documented gaps in health information within the Black communities in England. This is similar to findings from Chinouya and Madziva (2017) which demonstrates that not addressing cultural understanding on the timing of antenatal care booking may result in unintentional delay in booking, as some cultural beliefs among some Black African women suggested that early booking is inappropriate. The emphasis on culturally tailored content reflects broader literature on cultural competency in healthcare. Farooqi et al., (2022) and the NHS Race and Health Observatory (2025) have documented how interventions developed without meaningful community consultation perpetuate health inequalities through epistemic exclusion.

In addition, participants perceived the proposed health promotion app as beneficial not only for community members but also for service providers, suggesting it could serve as a bidirectional education tool. This finding diverges from typical health app literature, which predominantly frames such technologies as patient-facing interventions. The notion that services providers could “use the app to inform some of the solutions to the problems in the community” suggests participants envision the proposed health promotion app as a bridge building mechanism that could address documented provider knowledge gaps related to Black peoples’ social, cultural, and structural determinants of health. This aligns with calls for systemic approaches to addressing health inequalities that involve educating healthcare systems and not just communities (Clair et al., 2016). Moreover, the finding that the proposed health promotion app for

Black people in England could help break stigma-related barriers to healthcare access needs special attention. Participants described how stigma prevents help-seeking behaviours, especially for mental health concerns. This relates to the HBM construct of perceived barriers, where stigma functions as a psychological and social barrier that proposed health promotion app could potentially mitigate through anonymous information access and community support features. Clair et al. (2016) emphasised understanding of stigma through a cultural lens to foster healthcare access, and participants' expectations suggest a culturally appropriate health promotion app for Black people could provide this culturally informed approach to stigma reduction.

4.6.3 Motivations for Health App Use: Beyond Functionality to Community Connection

The study's findings on motivation factors reveal a nuanced understanding of what drives sustained health app engagement, extending beyond the basic functionality emphasised in much health app literature. The HBM construct of perceived benefits is clearly operationalised in participants' emphasis on the proposed health promotion *app "fulfilling its expectations"* and providing '*informative, current, and interactive content.'* However, participants' articulation of these motivations reveals complexity not fully captured by traditional HBM application. The requirement that the proposed health promotion app not only meet but exceed expectations aligns with McCurdy et al.'s (2012) user-centred design principle that health apps that fail to satisfy the users initially are unlikely to remain active on their devices. However, this study extends the findings from McCurdy et al. (2012), by revealing that for the proposed health app users in England, *"relevance"* encompasses not just functional utility but cultural resonance. The participant's statement that they would continue using the proposed health promotion app *"if it is meeting my expectations and exceeding them probably"* suggests a conditional engagement contingent on the health promotion app's ability to

demonstrate an ongoing value through both functional performance and cultural alignment. The general expectation is that the proposed app will be culturally aligned to the needs of the Black community, but it is also expected that there will additional features that would keep the users engaged and interested. The emphasis on informative content that uses *"casual"* rather than technical language represents an important design consideration that could be overlooked in health app development. Participants description of preferred communication styles, exemplified by the Instagram health educator who *"adds humour"* while explaining serious health problems *"without making it sound too academic,"* challenges assumptions about health communication needing to maintain clinical formality. This finding supports the work of Gonzales (2019) on accessible health communication but extends it by showing that accessibility for Black communities may require not just simplified language but culturally familiar communication styles that incorporate humour, storytelling, and relatable contexts.

The desire for interactive features, such as community forums and chat groups where users can "speak up" and share experiences, reveals a communitarian orientation that contrasts with the individualistic focus of many health apps (Alqahtani and Orji, 2020; Lee et al., 2024). This aligns with Linardon et al. (2019) which demonstrated that health apps that incorporate peer support as a primary technique had higher engagement rates than those that do not. Even though such connection with peers could motivate health-improving behaviours, the participants in this study articulated a specifically cultural dimension to this need. The emphasis on creating spaces where Black people can *"feel safe and free to share their experiences"* suggests that interactive features serve not merely as engagement mechanisms but as convenient space community-building and mutual support that may not be available in the mainstream healthcare

contexts. In addition, the ambivalent reception of gamification requires deeper understanding. Even though many participants welcomed gamification as added value to the proposed app, describing as making health behaviours *"fun and interesting,"* others perceived it as potentially undermining the seriousness of health concerns. Such difference in perception of gamification has not been adequately addressed in literature, which tends to portray it as a universally beneficial engagement (Lee et al., 2017). The concerns from participants that the proposed health promotion app *"should be free from gamified features which could pose as a distraction"* reveal cultural considerations about framing of health interventions. This finding is supported by Cugelman (2013) and Rigby (2013) that warned that gamification does not automatically guarantee an increased motivation towards a desired health improving behaviour or engagement, suggesting that a cultural perception of health and culturally appropriate communication styles should inform the implementation of gamification in a health promotion app for Black people in England. Despite younger participants' perception that the older Black adults in England would not appreciate a gamified health promotion app, many older participants enthusiastically described their experiences using gamified health app. One of them gave a detailed account of how a gamified smoking cessation app supported them for a sustained behavioural change *("it like playing a game with my ego")*. This finding contradicts the age-based stereotype about technology adoption and aligns with Koivisto and Malick (2020), a systematic review that showed positive outcomes of gamification for adults aged 55 and above. This does suggest that the addition of gamified elements to the health promotion app for Black people in England should be guided by cultural and individual preferences, rather than age alone.

6.6 Conclusion and Signposting

The qualitative analysis in this study identified five themes that operationalise what constitutes a culturally appropriate health promotion app for Black people in England. The study addressed objective 1 by identifying perceived benefits centred on accessing culturally relevant information and addressing health needs specific to Black people, while the also identifying perceived barriers which included data security concerns and limitations in accessibility. Motivation towards health app adoption is contingent on delivering credible, interactive content enhanced by gamification features that present information on illness susceptibility and severity. Objective 2 revealed that participants prefer an app prototype featuring intuitive user interface design, transparent content development processes, and explicit privacy and security assurances. The next chapter, will discuss the finding from the two studies (study 1 and study 2 combined) in more detail and will lead to the recommendations for a culturally appropriate health promotion app for Black people in England, based on findings from the two studies combined, and thereby addressing objective 3.

CHAPTER SEVEN

The Main Discussion

7.1 Integrating Quantitative and Qualitative Findings on the Feasibility and Design of a Culturally Appropriate Health Promotion App for Black People in England.

This mixed methods study explored the feasibility of a culturally appropriate health promotion app designed specifically for Black people in England. The quantitative cross-sectional survey established the patterns of health app adoption, trust, and preferences among Black people in England, whilst the qualitative focus group discussions provided rich contextual understanding of the perceived benefits, motivations, and barriers to health apps use. The integration of these two methods and their findings reveals both convergence and complementary insights that strengthen our understanding of technology adoption within this population.

7.1.1 The Theoretical Framework: Health Belief Model

The Health Belief Model (HBM) provided the theoretical foundation for the design and analysis of the qualitative focus group interviews. The HBM posits that health-related behaviour is determined by individuals' perceptions of the severity of and susceptibility to health threats, the perceived benefits and barriers to health action, and cues to action. Applied to this study, the HBM framework enabled systematic exploration of participants' perception regarding a culturally appropriate health promotion app.

Theme 3 was constructed on perceived susceptibility and severity (Information on Illness Susceptibility and Severely), where participants articulated concerns about their vulnerability to health conditions affecting Black people in England and expressed worries about accuracy of health information and mental health impacts. Perceived benefits were captured in Theme 1, where participants identified that a culturally appropriate health promotion app could address health needs specific to Black people

in England, provide access to healthcare, and foster trustworthiness, all of which constitute the perceived benefits of engaging with the proposed app. Perceived barriers were systematically explored in Theme 4, with data security and confidentiality concerns emerging as significant obstacles to health app adoption.

The HBM framework also illuminates the role of cues to action in the quantitative findings. The striking gap, that 59.7% of respondents had never been recommended a health app by a healthcare provider, represents an absence of clinical cues to action. Healthcare provider recommendation serves as a potent cue to action (Bunten et al., 2020) within the HBM. The low recommendation rate in this population may partly explain both the moderate adoption rates and the significance of trust concerns. The quantitative finding that prior health app experience predicts preference for a culturally appropriate health promotion app may reflect the development of perceived efficacy through prior experience, a construct closely related to the HBM's action pathway.

Notably, the HBM's emphasis on perceived severity and susceptibility is tempered by the quantitative finding that perceived wellness had no significant association with health app download and use. This suggests that objective or subjective current health status does not drive health app adoption among people in this study. Instead, the qualitative data on motivations (app fulfilling expectations, informative content, gamification) suggest that perceived benefits related to engagement and functionality may outweigh health threat perception in determining health app adoption. This represents an important refinement to the HBM application in the digital health context: for health promotion apps, motivational features and user experience may be as important as health threat perception in driving behaviour change.

The HBM framework was therefore valuable in structuring the qualitative exploration, and the findings both confirm key HBM constructs (perceived severity, susceptibility,

benefits, and barriers) whilst also revealing that in this population and context, engagement and functionality considerations may operate alongside or even supersede traditional health threat perception pathways.

7.1.2 Perceived Wellness and Health Status: Non-Predictors of Health App Use

The finding that perceived wellness had no significant association with health app download and use suggests that health app adoption is not simply a function of individuals recognising themselves as unwell and seeking solutions. Instead, app use may be a driven by other factors such as curiosity, peer influence, specific acute health concerns, or intrinsic interest in health monitoring, which might all be independent of general health perception (Wang and Qi, 2021). This finding has positive implications for a culturally appropriate health promotion app for Black people in England aimed at health promotion rather than disease management. Such app will therefore not depend on users perceiving themselves as unwell to be motivated to use it.

An unexpected finding emerged regarding self-reported health by ethnic subgroup: Black African participants reported substantially better health (67%) compared to Black Caribbean participants (31%). This 36-percentage point difference warrants careful interpretation as it differs from findings from a US-based study, Erving (2011), which suggested Caribbean Black Immigrants had better self-reported health score than African Americans. While ethnic categorisation within the broader Black population is increasingly recognised as important (Devonport et al., 2022), such disparities may reflect several factors beyond actual differences. First, self-reported health is subjective and influenced by cultural framings of health, healthcare access, experiences, and migration-related factors (Cloos et al., 2020; Kajikhina et al., 2023). Black Caribbean respondents, as the longest established Black population in England (George, 2023), may have had more sustained exposure to healthcare barriers and

systemic inequalities, potentially influencing their health perceptions. Alternatively, differences may reflect differential health literacy, healthcare system navigation, or trust in health institutions. These findings suggest that a generic health promotion app may not adequately address the heterogeneous needs and contexts within the Black population. A culturally appropriate health promotion app for Black people in England should be sensitive to these intra-ethnic differences in its design and messaging.

7.1.3 Health App Adoption, Discontinuation, and Prior Experience

The quantitative findings revealed that just over half of respondents (54.8%) had previously downloaded and used a health app, suggesting a moderate familiarity with health technology among Black people in England. However, this apparent adoption was tempered by a striking discontinuation rate: 70.9% of those with prior health app experience had discontinued a health app they previously downloaded, and loss of interest was the predominant reason (57.9%). This high discontinuation rate aligns with broader research on mobile health app uptake (Amagai et al., 2021; Kreb and Duncan, 2015), where engagement drops sharply within weeks to months of download. The finding that health app use discontinuation among the participants is driven primarily by loss of interest, rather than technical problems or cost as in Amagai et al. (2021), suggests that users found the app insufficiently engaging, relevant, or rewarding for sustained used. This therefore signals the need for a culturally appropriate health promotion app to prioritise user engagement design, including meaningful personalisation, clear health behaviour benefits, and mechanisms to maintain motivation over time. The proposed app must address not only the decision to download but the far greater challenge of sustained engagement. Study 2 provided an insight into why some users may discontinue a health app they initially downloaded.

One such reason was an app not fulfilling its expectations and therefore making its users lose interest in its sustained use.

Moreover, a critical pattern was that most app downloaders (94.3%) had only downloaded 1-5 health apps in their lifetime, unlike the findings from a similar study in US population, Kreb and Duncan (2015), which found that over 42% of the population had downloaded 6 or more health apps. This suggests that while health app use is not entirely novel to the Black population in England, engagement remains superficial and limited in scope. Most participants have not explored multiple health apps or integrated health technology deeply into their health management routines. This moderate but limited prior adoption is an important context for the proposed app. Respondents are not entirely resistant to the technology, but neither have they developed sustained engagement patterns.

The qualitative focus group discussions provided crucial context for understanding the health app discontinuation pattern. Participants articulated clear expectations about what could motivate sustained health app use, and this was centred around three key dimensions: the app fulfilling its expectations; the provision of informative, current, and interactive content; and the incorporation of gamification aspects to the app. Although the use of gamification could promote sustained use of the proposed app, the choice of gamification and how it is presented to user should be well crafted, and if possible, presented as an optional function on the app, as some respondents did not perceive a need for such feature in a health app.

7.1.4 The Critical Role of Trust and Prior Experience

One of the strongest quantitative findings was the significant relationship between prior health app download and use, and preference for a culturally appropriate health promotion app for Black people in England. This robust association suggests that prior

positive experience with health technology is a powerful predictor of interest in culturally appropriate health apps. Notably, this relationship was substantially stronger than the near significant finding regarding trust concerns, indicating that experience may outweigh trust as a determinant of health app preference. Such finding aligns with Rai and Srivastava (2024), which suggested that health app users' experience with health apps they have used in the past is one of the factors that could influence trust in young users.

The qualitative data illuminates why prior experience is so influential. Focus group participants identified trust-building as a central perceived benefit of a culturally appropriate health app, specifically highlighting the capacity to foster trustworthiness. This suggests that participants who had successfully navigated health apps may have developed transferable confidence in health technology, which could be leveraged to build trust in a culturally targeted health app. Conversely, amongst the 45.2% who had never downloaded a health app, not trusting health apps was cited as a primary barrier (70.6%). The qualitative focus groups revealed that concerns about data security and confidentiality were a significant perceived barrier to health app use, and these concerns may underpin the quantitative finding that trust remains a near significant predictor of health app preference.

7.1.5 Healthcare Provider Recommendation and Professional Endorsement

59.7% of respondents had never been recommended a health app by a healthcare provider or professional. This is below the national average for healthcare provider recommendation for health apps as the Organisation for the Review of Care and Health Apps (ORCHA, 2022) revealed that about half of health app users got them from healthcare professionals. Such gap is also supported by findings from the NHS Race and Health Observatory Authority (2023), as discussed in Chapter 1. This

substantial gap between available technology and professional recommendation has important implications. The absence of professional endorsement may contribute to the trust concerns identified in both studies and may explain why many participants had not engaged with health apps despite their availability. The qualitative findings regarding perceived benefits provide a potential pathway to address this gap. Participants identified that a culturally appropriate health app could address health needs specific to Black people and could provide access to information and healthcare. If healthcare providers and professionals, particularly those serving in Black communities, were to actively recommend and endorse such an app, it could simultaneously address the recommendation gap and leverage professional credibility to build trust. This presents an important implementation consideration: the development of the proposed health app should be accompanied by a professional endorsement and recommendation strategy. Leigh et al., (2020) looked at the barriers and facilitators for UK healthcare providers' adopting and recommending health apps and the two most common facilitators for prescribing health App were an app having an NHS stamp approval, and the health app being recommended by another healthcare provider. The study also revealed that with increasing patients' age, health app recommendation by healthcare professionals decreased. This supports the ageist assumptions discussed in sections 7.1.8 below, that should be countered in the strategy for professional endorsement and recommendation of a culturally appropriate health promotion app for Black people in England.

7.1.6 Perceived Benefits: Addressing Health Inequalities

The quantitative findings identified three key perceived benefits of a culturally appropriate health promotion app for Black people in England: providing access to information and healthcare; addressing health needs specific to Black people; and

fostering trustworthiness. These benefits should be understood in the context of known health inequalities affecting Black people in England, discussed in chapter 1, and these include higher prevalence of conditions such as hypertension, type 2 diabetes, and maternal mortality (Bidulescu et al., 2015; Hajat et al., 2001; NHS, 2022; Rayner and Spence, 2021). The quantitative data provided an insight into the complexity of health within Black community in England. Black African participants reporting a substantially better self-reported health (67%) compared to Black Caribbean participants (31%), suggests significant heterogeneity within the Black population. This underscores the importance of cultural appropriateness. A health app designed generically for Black people may not adequately address the distinct health need, experiences, and priorities of Black African, Black Caribbean, and other Black ethnic groups. The qualitative emphasis on addressing the health needs specific to Black people should therefore be interpreted as requiring not merely cultural sensitivity but genuine cultural specificity, potentially tailored to distinct Black ethnic subgroups.

7.1.7 Motivation and Engagement: Moving Beyond Passive Use

The quantitative finding that perceived wellness had no significant association with health app download and use (χ^2 = 1.8, p = .176) is important as it suggests that subjective health status does not predict health app adoption. This contrasts with the qualitative finding that participants articulated clear, detailed motivations for health app use. The qualitative data identified three key motivational dimensions: the app fulfilling expectations, provision of informative and current content, and incorporation of gamification. This apparent divergence suggests that motivation to use health apps is not predicted by current health status but rather by anticipated value and engagement features. This aligns with the Expectancy-Value Theory which posits that motivation is determined by not only a belief that one can succeed at performing a task but, also the

perceived value in performance of the task (Eccles and Wigfield, 2002). For a culturally appropriate health promotion app for Black people in England, this has important implications. Marketing and implementation strategies should emphasise anticipated benefits and engagement features rather than based on health status. The qualitative insight regarding gamification is particularly noteworthy. This feature emerged from focus group discussion as a motivation factor yet may not be immediately intuitive to health app developers or commissioners. Including user-centred participatory design processes as reflected in the focus groups is therefore essential to ensure that developed health apps align with user motivations.

7.1.8 Age and Technology Adoption: Challenging Ageist Assumptions

Contrary to the assumptions that older adults are less likely to adopt health technology, age showed no significant relationship with health app download and use ($r = -.053$, $p = .297$) amongst the study participants. This is different from the findings from Onyeaka et al. (2020) which suggested that US older adults were less likely to own a smartphone or use health apps and were less likely to report health technology as being a useful tool for health promotion. The null finding in the PhD research challenges the stereotypes about digital divides (Krueger et al., 2018) and suggests age-based assumptions may not apply to the Black population in England. However, a culturally appropriate health promotion app for Black people in England should not take the 'age as a non-factor' for health app use and download in this population for granted. Instead, the design should incorporate the factors that are deemed as facilitators for health app use in older population, such as self-paced learning, remotely accessible support, and learning methods that are flexible (Pang et al., 2021).

7.1.9 Information, Illness Susceptibility, and Health Literacy

The qualitative focus groups revealed important concerns regarding illness susceptibility and severity, specifically around credibility and accuracy of diagnosis and mental health concerns. These concerns suggest that participants were attentive to the quality and reliability of health information provided through health apps and were particularly concerned about conditions with significant psychological and social dimensions. The quantitative data did not directly assess health literacy or information seeking behaviour, limiting the ability to quantitatively characterise the prevalence or severity of these concerns. However, the near-significant relationship between trust concerns and health app preference (χ^2 = 3.634, p = .057) may reflect underlying concerns about information credibility as this was one of the concerns raised in the focus group discussions. For health app development, these qualitative findings suggest that rigorous clinical review processes, transparent sourcing of medical information, and explicit attention to mental health content quality are essential to build credibility and address participants concerns.

7.1.10 Data Security, Confidentiality, and Digital Mistrust

Concerns about data security and confidentiality emerged as a significant perceived barrier in the qualitative analysis. This finding should be understood in the context of both broader digital privacy concerns and specific historical experiences and perception of health data misuse within Black communities (Dove et al., 2022). The quantitative finding that not trusting health apps was cited by 70.6% of non-users as a barrier suggests that data security concerns may be widespread within the Black community. For the proposed app development and implementation, this barrier necessitates more than standard data protection compliance. The qualitative analysis highlights that there is need for more transparency on the measures taken to protect users' data rather than just a mere statement of data protection assurance. Some

participants shared sentiments on how they have been subjects to data harvesting and as a result have been targeted for advertisements that they were not necessarily interested in. Therefore, to build trust on data security and confidentiality regarding the proposed health app, explicit transparency and culturally sensitive communication about data security practices are required. Privacy policies should be written in accessible language, data handling practices should be clearly explained, and where possible, community involvement in governance of data use should be considered. Neal et al. (2023) suggested that these are currently lacking in many of the contemporary health apps in the market. Such opportunity to rebuild trust through genuine transparency and community partnership should not be taken for granted.

7.1.11 Gender and App Adoption: Translating Findings to Implementation

The quantitative analysis revealed that female respondents were significantly more likely to download and use health apps when compared to male respondents ($\chi^2 = 9.3$, $p = .002$). This finding aligns with broader research on gender differences in health-seeking behaviour and technology adoption (Devi et al., 2025; Escoffery, 2018). However, the significant gender difference in health app download and use was not explored in depth in the qualitative focus groups. This finding differs from that found in Malaysian population where the difference in gender uptake of health apps was minimal with females being higher user by only 8% (Mustafa et al., 2022). Conversely, a study on US population showed no significant difference between male and female health app adoption and use (Kreb and Duncan, 2015). The significant difference in gender and health app adoption in this PhD study needed more qualitative analysis to contextualise what this means for the potential health app development. The implementation, recruitment and engagement strategies may need to be tailored to address specific barriers faced by male users within the Black community in England,

which may include privacy concerns, different motivations, or different preferred features.

7.1.12 Barriers to Health App Adoption: Need and Trust

Among the 45.2% who had never downloaded a health app, the most common reasons were not needed an app (71.8%) and not trusting apps (70.6%). These findings point to distinct barriers requiring different solutions. The ‘not needing’ barrier suggests that some respondents do not perceive health technology as addressing their current priorities. This may reflect either genuine absence of need or, more likely, a lack of awareness of what health apps could offer. This position is supported by the finding that among those who initially showed no interest in health apps, there was significant association between offering them a culturally appropriate health promotion app and willingness to download a health app. Despite not showing interest in health apps in the past, these respondents were likely to download and use the proposed app. Educational messaging about potential benefits and functions of the proposed culturally appropriate health promotion app may address this barrier (Bright et al., 2017). Conversely, the trust barrier is more concerning. Distrust of health technology aligns with documented mistrust of healthcare institutions among Black people in England (Paul et al., 2022), which is rooted in the historical and ongoing experiences of medical racism, discrimination, and health inequality in England (Majors, 2020; Paul et al., 2022; Thomson, 2025). This finding underscores that app adoption for Black people in England cannot be separated from the broader issues of institutional trust and health equity. A culturally appropriate health promotion app for Black people in Egland must be designed and promoted with explicit attention to trustworthiness, data privacy, community benefit, and transparency about how data will be used and protected.

7.1.13 Prior Use as a Strong Predictor of Interest in The Proposed App

The strongest finding in this study is the significant relationship between prior health app download and use and preference for a culturally appropriate health promotion app for Black people in England (χ^2 = 33.9, p < .001). Those with previous app experience are substantially more likely to express interest in the proposed health app. This suggests that prior successful engagement with health technology creates openness to new health apps. Conversely, those without prior health app experience may have lower baseline interest. This finding has crucial implications: a culturally appropriate health promotion app for Black people in England will likely be most readily adopted by those already engaged with health technology. To reach those without prior health app experience, the app development must priorities partnership with the Black community, integrate existing trusted services, and explore and lower barriers to initial app adoption.

7.1.14 Trust and Health App Preference: A Nuanced Relationship

The relationship between trust concerns and preference for a culturally appropriate health promotion app for Black people in England approached but did not achieve statistical significance (χ^2 = 3.634, p = .057). While this null finding should be interpreted cautiously given the marginal p-value, it suggests that stated distrust of health apps in general does not necessarily translate to unwillingness to use a specifically designed culturally appropriate health promotion app for Black people in England. This finding is encouraging as it indicates designing a health promotion app specifically for Black people in England, presumably with attention to their specific concerns as detailed in Chapter 1, may overcome baseline trust barriers. Trust in the proposed health app may depend less on abstract trust in apps generally and more on whether the proposed app is perceived as serving the Black community's interest, protecting their data, and being developed with input from the Black community. The

nearly significant finding (p = .057) might reflect a true weak relationship or may indicate that contextual factors such as, how the app is introduced, who develops it, and community endorsement, may matter more than this binary measure. This was reflected in the findings from the focus group discussions.

7.2 Strengths of The Research

7.2.1 Methodological Rigor

One of the key strengths of this PhD research is that it employed a mixed-methods design, where Study 1 established a population level pattern while Study 2 explored mechanisms and meaning. This approach generates both breadth and depth, moving beyond “what” to “why” and “how” which is essential for understanding complex phenomena like technology adoption in the context of health equity. The use of the Health Belief Model to structure Study 2 provides a theoretically coherent approach to understanding health app adoption. Rather than ad-hoc exploration, the framework ensures systematic examination of key decision-making constructs. This grounding established health behaviour theory strengthens interpretability and comparability of findings. Study 1 adopted the approach used in Krebs and Duncan (2015), a US population-based survey that examined health apps use, and as well incorporated three of the eight areas (demand, acceptance, and implementation) Bowen et al., (2009) suggested a feasibility study should focus on. The sample size (N=387) was adequate for detecting meaningful associations, and null findings such as age and perceived wellness were reported transparently avoiding selective reporting of significant results.

7.2.2 Responsiveness to Policy and Practice

The research directly addresses the NHS Race and Health Observatory’s identified priority for designing research on digital health equity for ethnic minority populations.

This work is positioned to inform health policy regarding equitable digital health implementation. Rather than documenting barriers, the PhD research generated specific implementable design and dissemination strategies. The core design principles identified such as community co-design, data transparency, cultural tailoring, provider integration, community dissemination, engagement design, and intra-ethnic sensitivity, provide concrete guidance for developing culturally appropriate health apps. Moreover, the findings from this PhD research can immediately inform a prototype development, user testing protocol, and implementation planning for the proposed health app. The research therefore bridges the gap between academic evidence and real-world application.

7.2.3 Novelty and Originality

This is the first comprehensive research in England that examined both feasibility of and design requirements for a health promotion app for Black communities. While health app adoption research exists, none previously focused on this specific population within the context of England. In addition, the application of Health Belief Model within a digital health equity context is novel. Even though the model is widely used, its application specifically to understanding culturally appropriate technology design for minoritised population is less common.

7.3 Limitations of The Research

This mixed methods study, whilst providing valuable insight into culturally appropriate health promotion app for Black people in England, is subject to several limitations that warrant acknowledgement and consideration when interpreting findings and implementing recommendations. These limitations are discussed below.

7.3.1 Methodological and Design Limitations

7.3.1.1 Cross-Sectional Quantitative Design

The quantitative component employed a cross-sectional survey design, which captures associations at a single time point but could not establish causality or temporal relationship. Whilst findings reveal that prior health app experience predicts preference for culturally appropriate health app, the cross-sectional design could not determine whether positive experience leads to increased preference or whether individuals with predisposing interest in health apps are more likely to have used health apps previously. Longitudinal or prospective designs would strengthen causal inference.

7.3.1.2 Absence of Intersectional Analysis in Qualitative Data

While the quantitative findings revealed substantial heterogeneity between Black African and Black Caribbean participants, the qualitative analysis was not disaggregated by ethnic subgroups. This represents a significant analytical gap where qualitative themes might mask important differences in motivations, barriers, and perceived benefits across the Black ethnic groups, particularly given the stark percentage point difference in self-reported health between Black African and Black Caribbean participants.

7.3.1.3 Potential Digital Inclusion Bias

Study 1, the quantitative study, recruited participants who could be reached online and could have access to the online questionnaire due to the then restrictions posed by

the Covid-19 pandemic. This may have systematically excluded individuals with lower digital literacy, those without internet access, those who might have digitally disengaged, and those from more socioeconomically disadvantaged backgrounds. Individuals who participated in the study might therefore be more technology engaged than the broader Black population in England, and thus potentially inflating perceived feasibility and acceptability of the proposed health app.

7.3.2 Generalisability and External Validity

7.3.2.1 Geographic and Socioeconomic Scope

The research was conducted in England, and the findings may not be generalisable to the Black British populations in Scotland, Wales, or Northern Ireland, where healthcare systems, community structures, and technology infrastructure may differ.

7.3.2.2 Applicability to Health App Implementation

The research has established the feasibility of a culturally appropriate health promotion app for Black people in England but has not tested an actual app. Findings regarding perceived benefits, motivations, and barriers are based on hypothetical health app concepts rather than lived experience with functioning applications. Real-world implementation may reveal additional barriers or unexpected adoption patterns not apparent in the feasibility study.

7.4 Implication for Future Research

7.4.1 Addressing Heterogeneity Within Black Population

The striking difference in self-reported health between Black African (67%) and Black Caribbean (31%) participants represent a critical gap requiring further investigation. Future research must move beyond treating Black people in England as a monolithic category and instead employ intersectional approaches that examine distinct ethnic, cultural, and social experiences. Qualitative research should be stratified by specific Black ethnic subgroups to understand whether health needs, motivations, and barrier differ meaningfully between communities. This granular approach is essential for genuine cultural appropriateness rather than generic cultural sensitivity. The quantitative finding that women significantly outpace men in health app adoption (χ^2 = 9.3, p = .002) was not accompanied by gender-stratified qualitative analysis. Future research must explicitly examine how gender shapes both motivations and barrier with the Black community in England. This should include exploration of whether men face distinct privacy concerns, whether marketing messaging resonates differently across genders, and whether preferred health app features vary by gender. Mixed methods designs should ensure that focus group compositions and analyses are deliberately gender-balanced and analytically disaggregated.

7.4.3 The Trust Paradox in Historically Marginalised Populations

The tension between trust as a barrier and prior experience as a facilitator warrants deeper investigation. Longitudinal research tracking individuals through their first engagement with a culturally appropriate health app could illuminate how trust is built incrementally and what specific design features, governance structures, and transparency mechanisms most effectively establish trustworthiness. Research should examine whether trust-building pathways differ for individuals with varying levels of prior technology experience and historical health system encounters.

7.4.4 Health Status, Motivation, and Health App Adoption

The finding that perceived wellness does not predict health app download and use challenges conventional assumptions about health behaviour motivation. Further research should investigate what psychological, social, and structural factors drive health app engagement independent of current health status. Qualitative research exploring participants' anticipated benefits, identity alignment with health technology, and social influences would deepen understanding of motivational pathways beyond traditional health threat perception models.

7.4.5 Discontinuation Patterns and Long-Term Engagement

The 70.9% discontinuation rate among prior health app users represents a critical gap. Research should employ experience sampling methods or longitudinal tracking to understand the specific points at which users disengage and the particular mismatches between expectations and functionality that precipitate discontinuation. Qualitative exit interviews with users who have recently abandoned health apps would provide real-time insight into barriers to sustained engagement, whilst longitudinal designs could identify whether gamification, content freshness, and personalisation genuinely sustain engagement as participants suggested.

7.4.6 Age and Digital Inclusion

The finding that age does not predict health app adoption challenges persistent stereotypes about older adults and technology. However, research has not explored whether age shapes the specific design features, interface characteristics, or support mechanisms that older Black adults in England would elucidate, and whether universal design principle sufficiently address their needs with age-specific considerations given particular attention.

7.4.7 Healthcare Provider Endorsement as Implementation Science

The substantial gap in healthcare provider recommendation (59.7% had never been recommended a health app) warrants implementation science research examining barriers to professional endorsement, optimal recommendation strategies, and whether provider recommendation genuinely translates to improved adoption and sustained use. Intervention research testing whether co-designed professional endorsement campaigns increase both awareness and uptake would provide evidence for implementation strategies.

CHAPTER EIGHT

Recommendations From the Research

This PhD research concludes with three broad recommendations: recommendations on design and development of the app, recommendations of implementation, and recommendations on policy and health systems integrations. These are discussed in detail in the sections below. This chapter also highlights the PhD researcher's reflection on the research process and the main findings.

8.1 Design and Development Recommendations

8.1.1 Participatory Design and User Co-Production

The qualitative findings reveal that users have sophisticated, detailed understanding of features that would support sustained engagement, including gamification, content freshness, and personalisation. Future health app development should prioritise participatory design processes with explicit involvement of Black people in England throughout the development lifecycle, not merely at evaluation stages. This ensures that anticipated user motivations and preferences directly shape feature development.

8.1.2 Cultural Specificity Beyond Generic Sensitivity

Rather than designing a single health app for Black people, development should consider creating culturally distinct versions tailored to the specific health priorities, language preferences, and cultural context of Black African, Black Caribbean, and other Black ethnic communities. Alternatively, the health app architecture should enable modular customisation allowing users to select culturally relevant content pathways aligned with their specific identities and health concerns.

8.1.3 Rigorous Clinical Governance and Transparent Information Quality

Given qualitative concerns about information credibility, diagnosis accuracy, and mental health content quality, health apps should establish transparent, independent

clinical review processes. Information sources should be clearly attributed, evidence quality should be explicitly communicated, and users should be able to understand the basis for clinical recommendations. Mental health content warrants particular attention and should ideally involve consultation with mental health professionals and the Black community in England.

8.1.4 Privacy, Security, and Transparent data governance

Data protection compliance alone is not sufficient to address historical mistrust and contemporary privacy concerns. Health apps should implement accessible privacy policies written in plain language, provide clear visualisation of what data is collected and how it is used, and offer granular user controls over data sharing. Where feasible, community governance structures such as community advisory boards with authority over data use directions, should be established to rebuild trust through genuine partnership rather than top-down protection.

8.2 Implementation Recommendations

8.2.1 Healthcare Provider Engagement and Endorsement Strategy

Implementation should include systematic engagement with healthcare professionals serving Black communities in England, including general practitioners, community health workers, and specialist services. Professional development activities should be designed to build provider confidence and capacity to recommend health apps. Endorsement should not be generic but should emphasise how culturally appropriate health apps address specific health inequalities and fill gaps in current care delivery.

8.2.2 Gender-Tailored Marketing and Recruitment

Given significant gender difference in adoption, marketing and implementation strategies should be deliberately tailored to engage both men and women. This may involve distinct messaging channels, different emphasis on health app features and gender-specific community engagement. Recruitment for the health app testing and

implementation should oversample men to ensure that their barriers and preferences shape final implementation.

8.2.3 Age-Inclusive Universal Design

Whilst age does not predict adoption, implementation should embrace universal design principle ensuring accessibility across age ranges and digital literacy levels. This includes interface design supporting navigation for users with varying technology experience, options for text size and colour contrast adjustment, and accessible tutorial content. Marketing should explicitly communicate that the health app is designed for Black people across all ages in England, which may counter the age-based exclusion assumptions.

8.2.4 Addressing the Motivation-Engagement Gap

Implementation strategies should not target recruitment based on health status but rather should emphasise anticipated engagement value, informative content, interactive features, and gamification elements. Marketing messaging should communicate that the health app fulfils practical information needs and provides engaging and interactive experiences rather than positioning it solely as a health threat response tool. Regular content updates and interactive feature development should be resourced to sustain engagement beyond initial download.

8.3 Policy and Systems Recommendations

8.3.1 Integration with Health System Infrastructure

Policy at both local and central level should support integration of culturally appropriate health apps within the NHS and community health settings. This includes consideration of NHS App library inclusion, integration with electronic health records system where appropriate, and consideration of commissioning or subsidy models ensuring equitable access.

8.3.2 Regulations and Standards for Cultural Appropriateness

Regulatory frameworks should establish standards for what constitutes cultural appropriateness in digital health, moving beyond generic diversity principle to require meaningful ethnic specificity, community involvement, and evidence of addressing population-specific health inequalities. Health apps claiming cultural appropriateness should face scrutiny regarding the depth of community engagement and evidence of addressing specific health needs.

8.3.3 Research and Evidence Generation Funding

Sustained funding should support longitudinal research examining whether culturally appropriate health apps designed according to these recommendations meaningfully improve health outcomes, health equity, and sustained engagement among Black people in England. Implementation science research examining optimal implementation strategies, scalability, and cost effectiveness would provide evidence for wider rollout and systemic integration.

8.3.4 Community Partnership and Data Stewardship

Policy should mandate community involvement not only in health app design but in ongoing governance, data oversight, and evaluation. This includes creating mechanisms for community benefit from health app data, through research partnerships with community benefit sharing arrangement, and ensuring that communities have authorities in decisions about data use.

8.4 The PhD Researcher's Personal Reflection

At the start of this research journey, I was driven by the question: How can a digital health innovation serve the promotion needs of Black people in England without reproducing or worsening the existing health inequalities? This question emerged from the rapid technological advancement during a time when the Covid-19 pandemic shone more light on the health disparities that plagued the Black community. I therefore

wanted to move beyond documenting disparities to contributing to solutions. The research journey has been intellectually humbling and affirming in equal measure. I entered the PhD project with hypotheses about barriers to health apps adoption, imagining that if I could just identify the obstacles, solutions would follow logically. What the research taught me is that barriers are rarely simple; they are embedded in histories of institutional racism, medical mistrust, and structural inequality. The finding that general trust concerns do not preclude interest in a culturally appropriate app for Black people in England was particularly significant for my own thinking. It suggested that distrust is not a deficit to overcome but a reasonable response to context, and the solution lies not in convincing Black people to trust, but in building institutions and technologies deserving trust.

Working with Black participants across Study 1 and Study 2 has been the most rewarding aspect of this research. The quantitative survey respondents and focus group participants shared their experiences generously, often reflecting critically on their own app use patterns and what they felt was missing in the existing digital health offerings. Their insights were not uniform or uncritical, they were diverse, thoughtful, and sometime contradictory, reflecting the genuine heterogeneity within Black communities. The recognition that Black African and Black Caribbean populations have distinct histories, health experiences, and preferences pushed me toward more nuanced respectful analysis. It also reinforced that community engagement in research is not a box to tick, but a necessity for producing knowledge that use accurate, relevant, and actionable.

8.4.1 What My Research Revealed About Digital Health Equity

Through carrying out this research, I have come to understand digital health equity not as a technological problem but as a manifestation of broader social and structural

inequalities. The finding that the Black community received far less health app recommendation from healthcare providers than from family and friends is not primarily a knowledge gap from providers. It reflects differential access to digital health training, implicit assumptions about who benefits from technology, and structural constraints on provider time and resources. Similarly, trust concerns about health apps reflect lived experiences of healthcare racism, and data exploitation concerns rooted in historical medical abuses. The Health Belief Model, my theoretical framework, proved valuable for systematising exploration of these concerns, but I found that it required contextualisation within health equity framework. Perceived susceptibility and severity of health threats cannot be understood apart from the social determinants of health and structural racism that shape those threats. Perceived barriers are not just individual or technical challenges; they are embedded in institutional racism and medical mistrust. Self-efficacy is not merely individual confidence but is shaped by prior experiences of healthcare discrimination. Applying behavioural theory to equity work requires attention to the ways that behaviour and belief are shaped by the social context and power.

I am particularly proud of three aspects of this research. First, the mixed-methods design bridging quantitative feasibility and qualitative design exploration. Much research stops at identifying problem, fewer move towards co-producing solutions. By grounding app design recommendations in both population-level data and participatory qualitative research, this thesis contributes practical guidance alongside evidence of need. Second, the explicit attention to intra-ethnic heterogeneity. It would have been easier and more conventional to treat ‘Black’ as a single category. The choice to disintegrate and explore differences between Black African and Black Caribbean populations, while complicated analytically, reflects a commitment to specificity and

respect for the actual diversity of Black communities. This approach honours the principle that equitable research cannot treat marginalised communities as homogeneous. Third, the framing of trust concerns not as barriers to overcome but as rational responses to context. This reframing resists the tendency to pathologize Black scepticism of health institutions and instead locates responsibility with those designing and implementing health technologies. It asks: ‘how do we design and govern technology such that it deserves the trust of communities that have been harmed by health systems?’ This is more productive framing than ‘how do we convince Black people to trust our app?’

8.4.2 The PhD Research Offered Learning and Growth

This PhD research challenged and expanded my thinking in several ways. I entered the research with the assumption that health education and technological access were key, but the research revealed that trust and loss of interest were more salient. This pushed me to engage more deeply with the literature on medical mistrust and health behaviour change. I also underestimated the importance of representation and visibility in health app design. The qualitative research made clear that Black people wanted to see themselves reflected in the proposed app imagery and design, and not just to receive health information. This attention to the affective and representational dimensions of technology has enlightened my understanding of what makes digital interventions acceptable and effective.

This PhD work points out several implications I hope will shape future digital health research and practices. Researchers in this field should be aware that digital health equity requires expertise spanning technology, health behaviour, health disparities, and antiracism. It requires partnership with communities and not extraction from them. Developers of health apps should also be aware that cultural tailoring is not just a nice

to have addition to apps, it is essential to equitable outcomes. As for healthcare providers, active recommendation of evidence-based health apps to all patients, with special attention to equitable dissemination across all ethnic groups, is an important component of modern clinical practice.

I must highlight that while this research is comprehensive, it is not the final words as some key questions remain unanswered: Will the design principles identified translate to a health app that Black people in England download, use, and sustain engagement with? How will the implementation strategies such as clinical integration and community-based dissemination affect outcome? Can a single health promotion app serve the diverse needs of Black African and Black Caribbean communities, or will there be a need for distinct versions? These are not just questions, but are important considerations for the next phases spanning from prototype development, user testing, and pilot trials, to ultimately evaluating the health impact of the app.

This PhD work has been a journey of intellectual growth and a genuine engagement with an important problem. The work is grounded in the strong conviction that Black people in England deserve health promotion tools designed with them, for them, and accountable to them. It is also grounded in the strong belief that digital health innovations should not reproduce health inequalities but should instead contribute to more equitable health outcomes.

8.5 Contribution to the Literature and Theoretical Implications

These findings contribute to the growing literature on digital health equity and technology adoption in underrepresented populations. Most digital health research has been conducted in affluent, predominantly White populations, limiting applicability to other groups (Coss et al., 2023; Routen et al., 2022; Whitehead et al., 2022). By examining the feasibility of a health promotion app specifically for Black people in

England, this research highlights both similarities and difference from broader population. Like the general population where health app adoption in 2021 was only 47% (Organisation for the Review of Care and Health Apps (ORCHA), 2022), this sample showed moderate health app use, challenges with sustained engagement, and importance of prior technology adoption in predicting new health app adoption. However, the findings also highlight distinctive factors relevant to health equity: the prominence of trust concerns, the potential importance of ethnically targeted design, and the heterogeneity within the Black population by ethnicity. ORCHA's (2022) projection that NHS health app utilisation would reach 75% of the UK population by 2024 underscores healthcare provider endorsement and recommendation as critical mechanisms for adoption. However, this research reveals that the prevalence of professional health app recommendations to Black participants (40.3%) falls substantially below the national baseline of 55%, suggesting differential access to digital health guidance and a potential disparity in digital health equity. This finding highlights the need for healthcare provider training and support to ensure equitable dissemination of health apps across all populations, positioning professional recommendation as a key implementation strategy alongside technological innovation for advancing digital health equity.

8.6 Conclusion

This PhD thesis has addressed three overarching aims: to assess the feasibility of developing a culturally appropriate health promotion app for Black people in England, to identify and explore the barriers and enablers of health app use in the Black community in England, determining interest in a culturally appropriate health promotion app, and to explore a design framework to guide understanding and development of a culturally appropriate app for Black people in England. The research demonstrates that

a culturally appropriate health promotion app for Black people in England is feasible and desired. Study 1 established that even though health app adoption among Black people in England is moderate, there is substantial interest in a health app designed with and for the Black people and such interest is particularly influenced by prior experience. Critically, the near significant finding that general trust concerns do not preclude interest in the proposed app suggests that community-centred design can overcome technology mistrust. Study 2, which employed the health belief model, identified specific design and implementation requirements: genuine community co-design and governance, transparent data management, culturally tailored contents and representation, integration with healthcare providers, recognition of intra-ethnic diversity, and engagement mechanisms supporting sustained use.

This PhD thesis contributes three substantive advancements to digital health research. First, it fills a critical evidence gap identified by the NHS Race and Health Observatory regarding design research for digital health equity in UK ethnic minority populations. Second, it demonstrates that intra-ethnic heterogeneity is methodologically important and therefore changes the assumption of homogeneity within ethnic categories. Third, it bridges the gap between identification of barriers and generation of design solutions, providing actionable recommendations grounded in both population-level evidence and participatory research. The research reframes the question from “how can we get Black people to adopt health apps”? to “how should health apps be designed and governed to serve Black communities equitably?” This reframing recognises that trust concerns reflect rational responses to histories of medical racism and healthcare inequality, and that solutions lie in building trustworthy institutions and transparent governances.

While further research including prototype development, testing, and evaluation is required, this PhD research establishes both the feasibility and the design framework necessary to move from research to implementation. It therefore contributes to the broader goal of ensuring that digital health innovation reduces, rather than perpetuates health inequalities for Black communities in England.

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APPENDICES

Appendix 1.1: Letter of Access for Study 1

Mr Panikos Panayiotou

Strategic Sport - Sports Development Manager

Birmingham City Council

Neighbourhoods Directorate

Alexander Stadium

Back Straight Stand

Dear Sir/Madam,

Re: Study Participants Access Request

We are recruiting study participants for a research project to determine the feasibility of using a mobile phone App for health education/promotion for Black people in the UK and will be grateful if we could access participants through your platform.

My name is Basiru Gai and I am a PhD researcher at the Birmingham City University supervised by Dr Angela Hewett, Dr Atiya Kamal and Dr Pelham Carter. The study is being done in fulfilment of my doctoral degree requirement, and it is in partnership with the Birmingham City Council. Mr Panikos Panayiotou, the Sports Manager at Birmingham City Council, is also part of the supervisory team.

The aim of this study is to investigate the feasibility and design of an App for health education/promotion for Black people in the UK. The study has been *Approved by the Psychology Research Ethics Committee of the Birmingham City University.*

Participants will be asked to sign a consent form and fill an online survey questionnaire hosted by Qualtrics. Because this is an online survey, they can choose to fill the questionnaire at their convenience. The online form will be available to participants until July 1st, 2021, when data analysis is expected to begin. To participate in the study, one must identify as Black or have a Black background, currently reside in the UK, and must be aged 18 and above. Therefore, participants will be asked questions about their age, sex, and ethnicity. They will also be asked about their experience and opinion using smartphone health Apps. On average, the study takes 20 minutes, and participants will be allowed to fill the questionnaire once only.

There are no specific risks to this study over and above those experienced in everyday encounters. Although there are no direct benefits from taking part, it is hoped that the outcome of this study will inform our decision on designing an App that could be a useful health education/promotion intervention to the UK Black population.

In line with the regulations outlined by the British Psychological Society, participants can stop taking a part on the research study at any time without explanation. They will still be entitled to the same benefits as individuals who complete the study. They can also have their data withdrawn from the time you complete until July 1st, 2021, when the data will have been analysed and written up.

The study will not involve the collection of any personal information about participants except their age, gender, and ethnicity. This data will not be identifiable to them and is being collected to achieve the research objective. The research will be conducted strictly abiding by the General Data Protection Regulation (GDPR) and the guiding principles stipulated by the British Psychological Society.

Any personal information given will be unidentifiable to an external party. The data will be stored using a personalised anonymous code *(or pseudonym).* Participants will be given instructions on how to produce this at the beginning of the study.

The questionnaire is hosted by Qualtrics, which allows us to anonymise all participants making their answers untraceable to them. Moreover, the responses will be coded and analysed statistically making their data untraceable to them.

If participants wish to withdraw their data before data analysis begins, they will need to provide us with their anonymous code. Details on how to create this code can be found on the consent form.

All collected data will be stored in my BCU password protected OneDrive account for a maximum of five years allowing time for the ramification of the doctorate degree and publication. The data will only be accessed by the research team. Findings from the study will be published in academic journals and conferences.

For any quarries or concerns, please contact me by email at Basiru.gai@mail.bcu.ac.uk or the director of the project, Dr Angela Hewett at angela.hewett@bcu.ac.uk.

Please contact the BLSS Faculty Academic Ethics committee directly at blssethics@bcu.ac.uk if you have any concerns relating to the ethical conduct of this study.

Yours sincerely,

Basiru Gai

PhD Researcher

Birmingham City University

Appendix 1.2: Participant Information Sheet for Study 1

PARTICIPANT INFORMATION SHEET

Research Title: Feasibility and Design of a Culturally Appropriate Health Promotion App for Black People in England

STUDY BACKGROUND

You are being asked to take part in a research study on Feasibility and Design of a Black Health Education/Promotion App. The aim of this study is to investigate the feasibility and design of an App for health education/promotion targeting Black people in England. My name is Basiru Gai, and I am a PhD student at the Birmingham City University. I am being supervised by Dr Angela Hewett, Dr Atiya Kamal, and Dr Pelham Carter. This project is in partnership with the Birmingham City Council and Panikos Panayiotou is a member of the supervisory team. The study has been *Approved by the Psychology Research Ethics Committee.*

WHAT WILL YOU NEED TO DO?

In this study, you will be asked to sign a consent form and fill an online survey questionnaire hosted by Qualtrics. Because this is an online survey, you can choose to fill the questionnaire at your convenience. The online form will be available to you until the time specified on the email.

To participate in the study, you must identify as Black or have a Black background and currently reside in England. You must also be aged 18 and above. Therefore, you will be asked questions about your age, sex, and ethnicity. You will also be asked about your experience and opinion using smartphone health Apps.

HOW LONG WILL THE STUDY LAST?

On average, this study takes 20 minutes, and you will be allowed to fill the questionnaire once only.

ARE THERE ANY RISKS OF TAKING PART?

There are no specific risks to this study over and above those experienced in everyday encounters.

FURTHER GUIDANCE

Although this study is unlikely to result in greater risk than is encountered in everyday life, if you encounter distress, please let me or my supervisors know. Our contact details can be found at the end of this sheet. You can as well contact us if you require further guidance or any information about the study.

If you need any help with a medical condition, you are experiencing or want to know more about your health, please contact your GP surgery or find out more on the NHS website link provided below:

https://www.nhs.uk/conditions/coronavirus-covid-19/social-distancing/using-the-nhs-and-other-health-services/

ARE THERE ANY BENEFITS OF TAKING PART?

Although there are no direct benefits from taking part, it is hoped that the outcome of this study will inform our decision on designing an App that could be a useful health education/promotion intervention to the UK Black population.

YOUR RIGHT TO WITHDRAW AND WITHHOLD INFORMATION

In line with the regulations outlined by the British Psychological Society, you can stop being a part of the research study at any time without explanation. You are still entitled to the same benefits as an individual who completes the study. You can also have your data withdrawn from the time you complete until July 1st, 2021, when your data will have been analysed and written up. Please see contact details below if you wish to withdraw.
During the study, you also have the right to omit or refuse to answer or respond to any question that is asked of you.

YOUR RIGHT TO CONFIDENTIALITY/ANONYMITY
The study will not involve the collection of any personal information about you except your age, gender, and ethnicity. This data will not be identifiable to you and is being collected to achieve the research objective. The research will be conducted strictly abiding by the General Data Protection Regulation (GDPR) and the guiding principles stipulated by the British Psychological Society.
Any personal information given will be unidentifiable to an external party. Your data will be stored using a personalised anonymous code *(or pseudonym).* You will be given instructions on how to produce this at the beginning of the study.
The questionnaire is hosted by Qualtrics, which allows us to anonymise all participants making your answers untraceable to you. Moreover, the responses will be coded and analysed statistically making your data untraceable to you.
If you wish to withdraw your data before data analysis begins, you will need to provide us with your anonymous code. Details on how to create this code can be found on the consent form.
All collected data will be stored in my BCU password protected OneDrive account for a maximum of five years allowing time for the ramification of the doctorate degree and publication. The data will only be accessed by the research team. Findings from the study will be published in academic journals and conferences.

WHO IS ORGANISING THE RESEARCH?
Participants are able to contact me by email at Basiru.gai@mail.bcu.ac.uk or my supervisor Dr Angela Hewett at angela.hewett@bcu.ac.uk if you require further information or wish to withdraw from the study.
If you are unhappy at any point in the study, or if there is a problem, please contact the BLSS Faculty Academic Ethics committee directly at blssethics@bcu.ac.uk

Appendix 1.3: Participant Consent Form for Study 1

PARTICIPANT CONSENT FORM

Feasibility and Design of a Culturally Appropriate Health Promotion App for Black People in England

BRIEF SUMMARY OF PROJECT
This study aims to investigate the feasibility and design of an App for health education/promotion targeting Black people in England. You will be asked to fill an online questionnaire.

In order to participate in this study, we need to ensure that you understand the nature of the research, as outlined on the Participant Information page.

Please tick the boxes to indicate that you understand and agree to the following conditions.

I confirm that I have read the information sheet for this study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

I understand that in order to take part in this study, I should identify as Black or Black background and must be at least 18 years old. ☐

I understand that personal data about me will be collected for the purposes of the research study including age, gender, and ethnicity, and that these will be processed in accordance with the information sheet. ☐

I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason. ☐

I understand that my data is anonymous and will be stored on secure university servers. I understand that it will only be used by the investigators for research purposes and that there is a possibility this research will be presented at conferences or published in journal publications. ☐

I agree to take part in this study. ☐

PLEASE CREATE A PERSONAL IDENTIFIER CODE:
This should be made up of the first two letters of your mother's maiden name followed by the last two digits of your mobile phone number, e.g. DA85.

_____

Appendix 1.4: Research Advert for Study 1

Appendix 1.5: Survey Questionnaire for Study 1

Survey Questionnaire

Feasibility and Design of a Culturally Appropriate Health Promotion App for Black People in England

Demographic data:

1. Please select the answers that Applies most to you.

What best describes your gender?

Female	Male	Transgender Female	Transgender male	Prefer not to say.	Prefer to self-describe.
☐	☐	☐	☐	☐	☐ …….

2. Race/ethnicity

African	Caribbean	Any other Black, African, or Caribbean background
☐	☐	☐

3. What is your age?

☐

Perceived general health:

4. In general, what do you consider your health to be?

Poor	Fair	Average	Very good	Excellent
☐	☐	☐	☐	☐

Perceived effectiveness of health Apps

A health App here refers to a type of software designed to run on mobile devices such as smartphones, tablets, and smart watches and are used for any health-related reason.

5. Have you ever downloaded an “App” to track anything related to your health?

Yes	No
☐	☐

If answer is yes:

a. How many health-related smartphone Apps have you used?

1-5 Apps	6-10 Apps	11-20 Apps	More than 20

b. Please check off all the reasons you have used health Apps. (check all that Apply)

Track how much activity/exercise I get	
Help me watch what I eat	
Weight loss	
Show/teach me exercises	
To access health information	
Track a health measure	
Any other reason? Please specify	……

c. Are there any health Apps you downloaded and no longer use?

Yes				No
Reason for discontinuation				
Lost interest	There was hidden cost	Takes too much time to enter data	Any other reason? ……	

2. If answer to question 5 above is no:

Select the most important reasons you have not downloaded a health App.

Reason for not downloading a health App	**Strongly disagree**	**Disagree**	**Neither/nor agree**	**Agree**	**Strongly agree**
I'm just not interested in health Apps					
They cost too much to buy					
I don't trust letting Apps collect my data					
My health is fine, and I don't need one					
They would use too much of my data					
They are too complicated to use					

6. Has anyone ever recommended you use a health App?

Yes	No

If yes, who?

Doctor		Nurse		Family		Friends		Any other? Please specify
Yes	No	Yes	No	Yes	No	Yes	No	……..

a. What was the focus of the App?

b. What did you use it for?

c. The App was helpful.

Strongly disagree	Disagree	Neither/nor agree	Agree	Strongly agree

d. What was/was not helpful about the App?

e. What is the name of the App?

Demand and acceptability of a culturally Appropriate health App

7. Please the select the response that Applies most to you about the statement below:

a. I will download and use an App designed to improve Black people's health in the UK.

Strongly disagree	Disagree	Neither/nor agree	Agree	Strongly agree

b. Is there anything else you like to tell us about on why you would/would not download and use an App designed to improve Black people's health in the UK? Please write
……

8. What would you like to see in an App targeting to promote Black people's health in the UK? Please check off all that Applies.

Information related to particular health conditions	Exercise	Healthy Food	Mental health	Any other? …… …

9. Please select the response that Applies most to you about the statement below:
   c. I prefer to have an App designed for Black people's health interests rather than one that is for the general population.

Strongly disagree	Disagree	Neither/nor agree	Agree	Strongly agree

d. Would you like to tell us why?

Yes	No
Please write ……	

10. Would you be willing to participate in future research to design health information and education for Black people in the UK?

Yes	No	Not decided yet

11. If you would like to be contacted for participation in future studies on Black people's health, please follow the link below. This will lead you to a separate page to provide your email and keep this questionnaire discrete from the email you provide and therefore maintain anonymity.
https://(link-to-page-for-email-and-thank-you)

Appendix 1.6: Ethics Approval Letter for Study 1

Faculty of Business, Law & Social Sciences Research Office
Curzon Building, 4 Cardigan Street
Birmingham
B4 7BD

BLSSethics@bcu.ac.uk;

13/Sep/2021

Basiru Gai

basiru.gai@mail.bcu.ac.uk

Dear Basiru ,

Re: Gai /#9316 /sub1 /Am /2021 /Aug /BLSS FAEC - Feasibility and Design of a Black Health Education/Promotion App

Thank you for your application for approval of amendments regarding the above study. I am happy to take Chair's Action and approve these amendments, with the proviso that any relevant permissions and documents are updated.

Provided that you are granted Permission of Access by relevant parties (meeting requirements as laid out by them), you may continue your activity.

I can also confirm that any person participating in the project is covered under the University's insurance arrangements.

Please note that ethics approval only covers your activity as it has been detailed in your ethics application. If you wish to make any changes to the activity, then you must submit an Amendment application for approval of the proposed changes.

Examples of changes include (but are not limited to) adding a new study site, a new method of participant recruitment, adding a new method of data collection and/or change of Project Lead.

Please also note that the Committee should be notified of any serious adverse effects arising as a result of this activity.

If for any reason the Committee feels that the activity is no longer ethically sound, it reserves the right to withdraw its approval. In the unlikely event of issues arising which would lead to this, you will be consulted.

Keep a copy of this letter along with the corresponding application for your records as evidence of approval.

If you have any queries, please contact BLSSethics@bcu.ac.uk;

I wish you every success with your activity.

Yours Sincerely,

Ms. Monique Geijsbeek

On behalf of the Business, Law and Social Sciences Faculty Academic Ethics Committee

Appendix 1.7: Participants Debriefing Sheet for Study 1

DEBRIEFING SHEET
Feasibility and Design of a Culturally Appropriate Health Promotion App for Black People in England

Thank you for taking part in this study! Your time is really Appreciated.

SUMMARY OF PROJECT

Black people are disproportionately affected by some health conditions such as diabetes, stroke, hypertension, and cancers. Cultural and religious views have been linked to the way Black people view some diseases such as cancer, HIV and Sickle Cell disease. Moreover, having a different skin colour means that some of diseases manifesting as change in skin condition could be wrongly interpreted or misdiagnosed.

Delivering a culturally Appropriate health education to minority ethnic groups like the Black population in the UK could yield a better outcome in the prevention and management of diseases.

Smartphone Apps were found feasible for delivering health education intervention to American minority populations. However, it is not known if this evidence could Apply to the Black British population, given the social and cultural differences between the US and the United Kingdom. This study aims to examine the feasibility and design of an App for health education/promotion targeting Black people in England.

FURTHER GUIDANCE

If require further guidance or any information about the study, you can contact me or my supervisor on the emails provided at the end of this page.

If you need any help with a medical condition, you are experiencing or want to know more about your health, please contact your GP surgery or find out more on the NHS website link provided below:
https://www.nhs.uk/conditions/coronavirus-covid-19/social-distancing/using-the-nhs-and-other-health-services/

KEEPING IN TOUCH

Your data will be anonymised by Qualtrics and coded and analysed statistically as part of a data set. No data will be identifiable to you. All collected data will be stored in my BCU password protected OneDrive account for a maximum of five years allowing time for the ramification of the doctorate degree and publication. The data will only be accessed by the research team. Findings from the study will be published in academic journals and conferences. You can have your data withdrawn from the time you completed the questionnaire until July 1st, 2021, when your data will have been analysed and written up. If you wish to withdraw your data, you will need to provide us with your personal identifier code. This should be made up of the first two letters of your mother's maiden name followed by the last two digits of your mobile phone number, e.g. DA85.

You can email me (the researcher) on Basiru.gai@mail.bcu.ac.uk to find out the results/publications that arise from the study.

ANY MORE QUESTIONS?

We hope that you enjoyed participating in this study. If you have any further questions, please feel free to contact the researchers at the address below.

Basiru Gai Basiru.gai@mail.bcu.ac.uk

Dr Angela Hewett angela.hewett@bcu.ac.uk
Dr Atiya Kamal atiya.kamal@bcu.ac.uk
Dr Pelham Carter pelham.carter@bcu.ac.uk

If you are unhappy at any point in the study, or if there is a problem, please contact the BLSS Faculty Academic Ethics committee directly at blssethics@bcu.ac.uk.

Appendix 2.1: Letter of Access for Study 2

LETTER OF ACCESS

Dear Madam/Sir,

Date:01.03.2022

Re: Study Participants Access Request

We are recruiting study participants to participate in a focus group interview of 4 to 8 participants per group. The aim of this research is to explore design of a mobile phone App for health education/promotion for Black people in England. Culturally sensitive smartphone Apps could break barriers to achieving good health. We would therefore be grateful if we could invite participants through your platform, to conduct focus group interviews for the design of a Black Health App.

My name is Basiru Gai and I am a PhD researcher at the Birmingham City University. I am supervised by Dr Angela Hewett, Dr Atiya Kamal and Dr Pelham Carter. The study is being done in fulfilment of my doctoral degree requirement, and it is in partnership with the Birmingham City Council. Mr Panikos Panayiotou, the Sports Manager at Birmingham City Council, is also part of the supervisory team.
The study has been *Approved by the Psychology Research Ethics Committee of the Birmingham City University.*

Participants will be given the Information Sheet and allowed to ask any questions they may have before their participation. They will be asked to sign a consent form and participate in a focus group interview with 5 to 8 other participants in a group. They will be offered an opportunity to choose from available slots for either an online or face-to-face session.
To participate in the study, one should identify as having a Black background, currently reside in the England, and must be aged 18 and above. Therefore, participants will be asked questions about their age, sex, and ethnicity.

They will also be asked about their experience using mobile phone health Apps and as well as their opinion on the design of a health education/promotion App for Black people in England. The study is expected to last about 90 minutes, and participants will be reimbursed with shopping voucher of a total amount of £15 each, for their time.

There are no specific risks to this study over and above those experienced in everyday encounters. Although there are no direct benefits from taking part, it is hoped that the outcome of this study will inform our decision on designing an App that could be a useful health education/promotion intervention for Black population in England.

In line with the regulations outlined by the British Psychological Society, participants can stop taking a part on the research study at any time without explanation. They will still be entitled to the same benefits as individuals who complete the study. They can also have their data withdrawn within 7 days from the time you they took part in a

focus group interview. Because we will be using pseudonyms to help keep participants stay anonymous during the focus group interview, participants wishing to withdraw the data will need to provide the pseudonym they used during the focus group interview.

The study will not involve the collection of any personal information about participants except their age, gender, and ethnicity. The research will be conducted strictly abiding by the General Data Protection Regulation (GDPR) and the guiding principles stipulated by the British Psychological Society.

Any personal information given will be unidentifiable to an external party. The interview data will be transcribed and stored using a personalised anonymous code *(or pseudonym).* Participants will be given instructions on how to produce this at the beginning of the study.
All personal data will be removed from the data transcripts before storing in my BCU password protected OneDrive account for 10 years after completion of the project.

For any queries or concerns, please contact me by email at Basiru.gai@mail.bcu.ac.uk or the director of the project, Dr Angela Hewett at angela.hewett@bcu.ac.uk.
Please contact the BLSS Faculty Academic Ethics committee directly at blssethics@bcu.ac.uk if you have any concerns relating to the ethical conduct of this study.

Yours sincerely,

Basiru Gai
PhD Researcher
Birmingham City University

Appendix 2.2: Participant Information Sheet for Study 2

PARTICIPANT INFORMATION SHEET

DESIGN OF A BLACK HEALTH EDUCATION/PROMOTION APP

STUDY BACKGROUND

There is need to work with communities to design more accessible health resources, and therefore you are being asked to take part in a research study on Design of a Black Health Education/Promotion App. We are aiming to understand the views of people who identify as having Black heritage about what should be included in an App to improve and promote good health. My name is Basiru Gai, and I am a PhD student at Birmingham City University. I am being supervised by Dr Angela Hewett, Dr Atiya Kamal, and Dr Pelham Carter. This project is in partnership with Birmingham City Council and Panikos Panayiotou is a member of the supervisory team. The project has been Approved by the Psychology Research Ethics Committee.

WHAT WILL YOU NEED TO DO?

In this study, you will be asked to take part in a group discussion of 4 to 8 people. You will be asked your views and ideas about what should be included in an App to improve and promote good health in Black people. You are not obliged to answer any question and can chose to stop at any time you wish. To participate, you must be aged 18 above and identify as Black (African or Caribbean or as having any other black background).

You can choose between participating either in an online session via MS Teams, or a face-to-face one. No personal data apart from your age, gender and ethnicity will be required from you.

WHAT HAPPENS TO THE INFORMATION I HAVE PROVIDED?

You will need to sign a consent form to take part in any of the sessions. You can choose between participating in a face-to-face session or an online session.

The focus group interviews will be recorded for ease of transcription.

The face-to-face sessions will be recorded using an audio recording device and uploaded to my university password protected OneDrive account, which will only be accessible to the research team.

The online version will be video recorded on MS Teams, and you are free to turn off your camera during the session, if you wish. However, all participants will be restricted from accessing the recordings made in MS Teams for confidential reasons. The researcher will check and confirm that no participant has access to the recordings once a session is completed. These recordings will be kept secured in my BCU password protected OneDrive account until the data is transcribed and anonymised, after which they will be destroyed.

HOW LONG WILL THE STUDY LAST?

On average, this study takes 90 minutes. The first 60 minutes will be spent on discussion, and the last half an hour will be used to view and discuss App design ideas.

ARE THERE ANY RISKS OF TAKING PART?
There are no specific risks to this study over and above those experienced in everyday encounters. However, there are a few points that you may want to consider, which depend on whether you choose to participate in a face-to-face interview or an online interview:

To lower the risk of Covid-19 infection for participants wishing to participate in the face-to-face focus group interviews please ensure you are not experiencing any covid symptoms and if in doubt, we strongly encourage you to take a test and follow the government's guidelines. Moreover, the interview room will have the windows opened to allow fresh air circulation, and participants will be seated apart.

Although this study is unlikely to result in greater risk than is encountered in everyday life, if you encounter distress, please let me or my supervisors know. My supervisors could be reached on angela.hewett@bcu.ac.uk, atiya.kamal@bcu.ac.uk, or pelham.carter@bcu.ac.uk. You can as well contact us if you require further guidance or any information about the study.

If you need any help with a medical condition you are experiencing or want to know more about your health, please contact your GP surgery or find out more on the NHS website links provided below:

https://www.nhs.uk/conditions/coronavirus-covid-19/social-distancing/using-the-nhs-and-other-health-services/

Find an NHS psychological therapies service (IAPT) - NHS (www.nhs.uk)

Where to get urgent help for mental health - NHS (www.nhs.uk)

ARE THERE ANY BENEFITS OF TAKING PART?
It is hoped that the outcome of this study will inform our decision on designing an App that could be useful to England's Black population. Additionally, you will be offered a £15 shopping voucher as a reimbursement for your time.

YOUR RIGHT TO WITHDRAW AND WITHHOLD INFORMATION
In line with the regulations outlined by the British Psychological Society, you can stop being a part of the research study at any time without explanation. You are still entitled to the same benefits as an individual who completes the study.

If after completing the study, you decide you would like to withdraw, please contact the researcher within 7 days from taking part in the study. Please note, however, that due to the nature of focus group data it will not be possible to withdraw your individual data from the transcript. However, all necessary steps will be taken to remove individual data from analysis and final project output.

During the study, you also have the right to omit or refuse to answer or respond to any question that is asked of you.

YOUR RIGHT TO CONFIDENTIALITY/ANONYMITY
The study will not involve the collection of any personal information about you except age, gender, and ethnicity.

Any personal information given will be unidentifiable to an external party – Your name, signature and any other identifiable information will be kept separately from the main study data, which will be stored confidentially, using a personalised anonymous code: You will be given instructions on how to produce this at the beginning of the study.

Findings from this study will be disseminated through academic journals, conferences, and the Birmingham City Council. The transcripts with all personal data removed, will be kept in my BCU OneDrive account for 10 years after the completion of the project and will be permanently deleted thereafter.

WHO IS ORGANISING THE RESEARCH?
This research is being organised by me, Basiru Gai, a PhD candidate. You can reach me by email on Basiru.gai@mail.bcu.ac.uk.

If you are unhappy at any point in the study, or if there is a problem, please contact the BLSS Faculty Academic Ethics committee directly at blssethics@bcu.ac.uk.

Appendix 2.3: Participant Consent Form for Study 2

PARTICIPANT CONSENT FORM

Version:1 Date:01.03.2022

Project Title: Design of a Black Health Education/Promotion App

BRIEF SUMMARY OF PROJECT

This study aims to understand the views of people who identify as having Black heritage in England about what should be included in an App to improve and promote good health. You will be asked to participate in a focus group discussion with 4 to 8 other participants.

In order to participate in this study, we need to ensure that you understand the nature of the research, as outlined on the Participant Information Sheet.

Please tick the boxes to indicate that you understand and agree to the following conditions.

I confirm that I have read the information sheet for this study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

I understand that in order to take part in this study, I should identify as Black or as having a Black background and must be at least 18 years old. ☐

I understand that personal data about me will be collected for the purposes of the research study including age, gender, and ethnicity, and that these will be processed in accordance with the information sheet. ☐

I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason. ☐

I understand that my data is anonymous and will be stored on secure university servers. I understand that it will only be used by the investigators for research purposes and that there is a possibility this research will be presented at conferences or published in journal publications. ☐

I agree to audio/video recording and the use of anonymised quotes in research reports and publications. ☐

I agree to take part in this study. ☐

Signature..... Date.....

You can reach me by email on Basiru.gai@mail.bcu.ac.uk, or my supervisors on angela.hewett@bcu.ac.uk or the BLSS Faculty Academic Ethics committee directly at blssethics@bcu.ac.uk.

Appendix 2.4: Interview Schedule for Study 2

Interview Schedule

Welcome everyone. My name is Basiru Gai and I am the Principal Investigator for this project. Thank you for taking part in this focus group interview.

Before we begin, I would like to run you through a brief background for this project and the ground rules for participating in today's focus group interview.

Our first study examined the possibility of a Black Health App for health education/promotion for Black people in England and found that some people feel a Black Health App is possible for health education/promotion for Black people in England.

We are now building on these findings and are therefore exploring what the design of the proposed App should look like. Today, I will be asking you questions about the design of a Black Health App for Black people in England.

The information you give is voluntary, so you do not have to answer all or any of the questions should you choose not to.

I will be asking you questions, and the session will be recorded, so it is important we do not speak over each other so that everyone can hear each other and to allow for easy transcription of the data after the session.

I will be guiding the interview with a set of themes to cover, and I am aiming at finishing the session within the agreed 90 minutes.

Please remember that you can stop participating at any time without explanation or prejudice. However, if you decide to withdraw your data, you will need to contact me within 7 days from taking part in the study.

(For online focus group interview only) You were requested to bring along a piece of paper and a pencil to this online focus group interview. Please keep it handy. We will be using it towards the end of the session.

1. Perceived benefits	What do you think some of the benefits of having a Black Health App would be? Do you think that a Black health App would be more trustworthy than a general health App? Why or why not?
2. Perceived barriers	Tell us about some of the things that could affect your ability to use a health App. Is there anything that could potentially stop you from using a health App? Is there anything that would stop you from using a health App that is specifically for Black people?

3. Motivation and cue to action	If you downloaded a health App to your phone, what makes you want to continue using the App? What keeps you interested or motivated to use the App? Gamification “is the use of game design elements in non-game contexts”. Examples of Apps that use gamification include Headspace, eBay, Doulingo, and Nike + Run Club. Do you find App activities such as gamification more interesting than just accessing information or not, and why?
4. Perceived susceptibility	If the proposed App could tell how susceptible someone is to a particular disease, how would this information affect the person’s health?
5. Perceived severity	If the App could tell us about the seriousness of contracting an illness or disease, or the severity of the consequences of leaving it untreated, how would this affect one’s health or the actions taken towards one’s health?
6. Design prototyping	Here is an example of what the App might look like (they will be shown the design prototype). What do you think of the categories? What are some of the things you think should be added? What kind of contents would you like to see in each category? (For those on face-to-face focus group interview only) The purpose of this part of the focus group interview is to have a sketch of your design ideas and not to test your drawing skills. Therefore, your drawing does not have to be perfect at all. You have been provided with an A4 paper and a pencil in front of you. Do not write your name or any personal information on the paper. Please make a sketch of how you would like the Black Health App to look like. Can you please explain your ideal App? **Alternatively:** **(For those on online focus group interview only).** The purpose of this part of the focus group interview is to have a sketch of your design ideas and not to test your drawing skills. Therefore, your drawing does not have to be perfect at all. I will be taking a screenshot of your drawings towards the end of the session. Using the piece of paper and pencil you brought to this meeting, please make a sketch of how you would like the Black Health App to look like. Can you please explain your ideal App?
7.	Is there anything else you would like to add, or talk about concerning the design of an App for Health Education/promotion for Black people in England that we haven’t already discussed?

Appendix 2.5: Participants Debriefing Sheet for Study 2

DEBRIEFING SHEET

Research Title: Design of a Black Health Education/Promotion App

Thank you for taking part in this study! Your time is really Appreciated.

SUMMARY OF PROJECT

Black people are disproportionately affected by some health conditions such as diabetes, stroke, hypertension, and cancers. Delivering culturally Appropriate health education to minority ethnic groups such as the Black population in England could yield a better outcome in the prevention and management of diseases. This study aims at exploring the design of an App for health education/promotion for Black people in England.

Smartphone Apps were found possible for delivering health education interventions to American minority populations, the first study we conducted was find out if this was the same for England's Black population. The study confirmed that a Black health App is indeed possible for health education/promotion in England's Black community. We are therefore exploring the design of an App that is hoped to deliver health education/promotion to the Black community in England.

FURTHER GUIDANCE

If you require further guidance or any information about the study, you can contact me or my supervisor on the emails provided at the end of this page.
If you need any help with a medical condition you are experiencing or want to know more about your health, please contact your GP surgery or find out more on the NHS website links provided below: The NHS website - NHS (www.nhs.uk)
GP services - NHS (www.nhs.uk)

KEEPING IN TOUCH

The focus group conversation will be transcribed into text. All names and any other potentially identifying references will be changed to pseudonym.
If you decide you would like to withdraw, please contact the researcher within 7 days from taking part in the study.
Please note, however, that due to the nature of focus group data it will not be possible to withdraw your individual data from the transcript. However, all necessary steps will be taken to remove individual data from analysis and final project output.
You can email me (the researcher) on Basiru.gai@mail.bcu.ac.uk to find out the results/publications that arise from the study.

ANY MORE QUESTIONS?

We hope that you enjoyed participating in this study. If you have any further questions, please feel free to contact the researchers at the address below.
Basiru Gai Basiru.gai@mail.bcu.ac.uk
Dr Angela Hewett angela.hewett@bcu.ac.uk
Dr Atiya Kamal atiya.kamal@bcu.ac.uk
Dr Pelham Carter pelham.carter@bcu.ac.uk

If you are unhAppy at any point in the study, or if there is a problem, please contact the BLSS Faculty Academic Ethics committee directly at blssethics@bcu.ac.uk.

Appendix 2.6: Ethical Approval Letter for Study 2

Faculty of Business, Law & Social Sciences Research Office
Curzon Building, 4 Cardigan Street
Birmingham
B4 7BD

BLSSethics@bcu.ac.uk;

04/May/2022

Basiru Gai

basiru.gai@mail.bcu.ac.uk

Re: Gai /#10231 /sub1 /R(A) /2022 /Apr /BLSS FAEC - Design of a Black Health Education/Promotion App

Dear Basiru,

Thank you for your application and documentation regarding the above activity. I am pleased to take Chair's Action and approve this activity.

Provided that you are granted Permission of Access by relevant parties (meeting requirements as laid out by them), you may begin your activity.

I can also confirm that any person participating in the project is covered under the University's insurance arrangements.

Please note that ethics approval only covers your activity as it has been detailed in your ethics application. If you wish to make any changes to the activity, then you must submit an Amendment application for approval of the proposed changes.

Examples of changes include (but are not limited to) adding a new study site, a new method of participant recruitment, adding a new method of data collection and/or change of Project Lead.

Please also note that the Business, Law and Social Sciences Faculty Academic Ethics Committee should be notified of any serious adverse effects arising as a result of this activity.

If for any reason the Committee feels that the activity is no longer ethically sound, it reserves the right to withdraw its approval. In the unlikely event of issues arising which would lead to this, you will be consulted.

Keep a copy of this letter along with the corresponding application for your records as evidence of approval.

If you have any queries, please contact BLSSethics@bcu.ac.uk;

I wish you every success with your activity.

Yours Sincerely,

Dr. Kyle Brown

On behalf of the Business, Law and Social Sciences Faculty Academic Ethics Committee

Appendix 2.7: Participants Reimbursement Funding Application

BIRMINGHAM CITY UNIVERSITY
BLSS DOCTORAL RESEARCH COLLEGE
Application for Funds
The Faculty of Business, Law and Social Sciences gives PGRs the opportunity to Apply for discretionary funds if they are identified as being of benefit to the research programme. Funding Applications are considered by the Faculty Research Degrees and Environment Committee, where meetings take place Approximately every 6 weeks.
All orders if Approved will be made via the BLSS Doctoral Research College, payments made via any other route will not be reimbursed under any circumstance.
If you wish to Apply for funding please **ensure you read all the guidance and fully complete the form** before returning back to the BLSS Doctoral Research College, blssdoctoralresearchcollege@bcu.ac.uk **Please ensure that all sections of the form are completed. Incomplete forms will be returned.**
If costs are in another currency you must detail both that and the conversion costs in GBP.

Student Name: Basiru Gai	**Year of Study:** Year 3
Supervisory Team: Dr Angela Hewett, Dr Atiya Kamal, Dr Pelham Carter	
Reason for Fund Request: To cover cost for data collection for study 2	
Brief summary of the benefit to your Research Programme: Recruitment of study participants and data collection forms an integral part of my PhD. The population under study in my research are often referred to as 'hard to reach', which warranted the use of several methods for participants recruitment. One of these methods involves the reimbursement of £15 to study participants for their time in participating in a 90-minute Focus Group Interview.	
Supporting Statement by the Director of Studies/Supervisor (delete where Applicable)**:** Funding for participant recruitment was included in the Application for the funded PhD that Basiru is currently studying (original Application also attached to email). This funding is important for the PhD recruitment to progress, since Basiru will be recruiting hard to reach groups for data collection (participants who identify as having a Black ethnic background). Although the amount requested per person is more than was originally indicated on the PhD Application, the amount that Basiru is asking for does not exceed the overall amount that was indicated on the PhD Application (originally £585 x 2 = £1170, now requesting £720). This is because the number of focus groups and participants have changed slightly since the PhD Application was originally written.	
Previous Funding Application and Outcomes : Funding was Applied for on 24th February 2021 to attend a summer school course on Behaviour Change at the University College London. The cost of this course was £1365.00, and funding was not granted.	
Total Amount of Funding Received to date: None	
COSTINGS	
Funds Required: £720 This amount represents £15 for each of the participants in a focus group of up to 8 participants, and for a maximum of 6 focus groups. *Please note If you are Applying for travel expenses that the rate per mile for all PhD students is 18p.*	

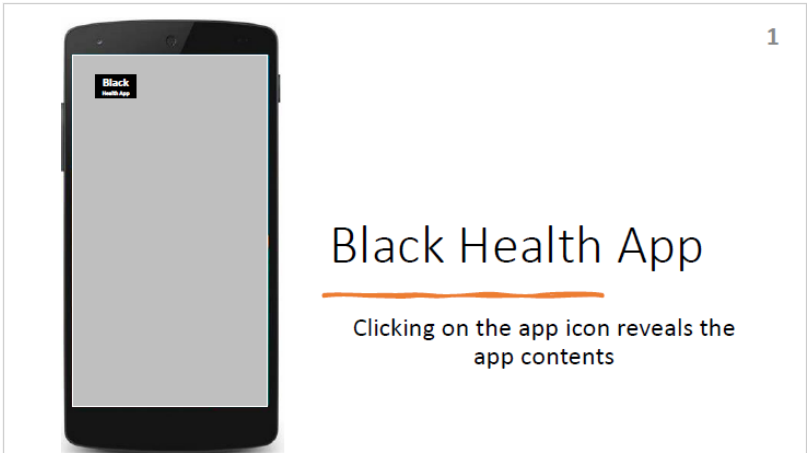
The decision of the Faculty Research Degrees and Environment Committee as to whether Approval is given in full, given in part or not Approved is final. You will be notified of the decision by the Doctoral Research College within 10 working days of the next available Committee meeting.

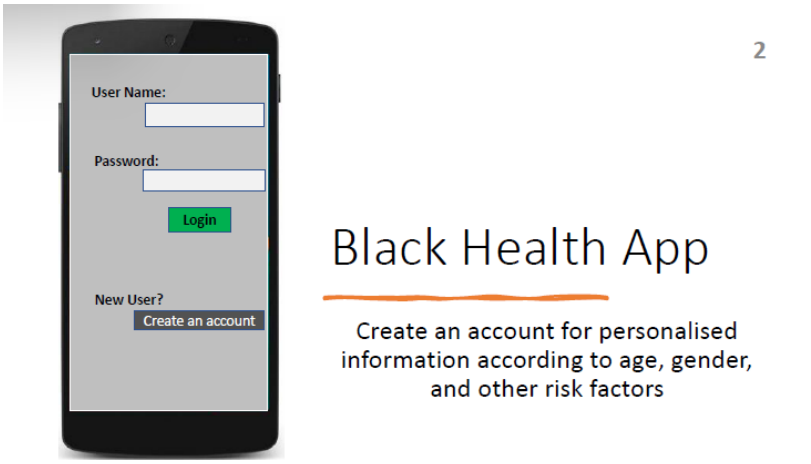
I understand that all payments need to be made via the Doctoral Research College and that I will not be able to be reimbursed for any costs undertaken myself. I also understand that in order to claim for subsistence that I will need to provide the original receipts upon my return.

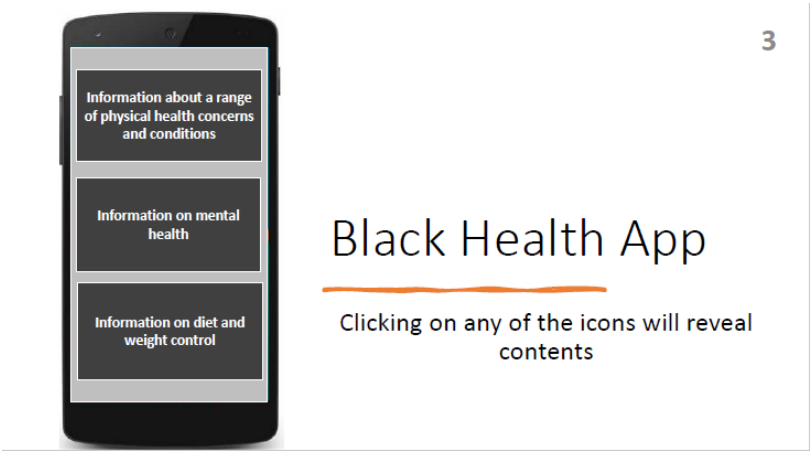
Signed: 
Printed: Basiru Gai
Dated: 05.05.2022
Please return **FULLY** completed Applications to blssdoctoralresearchcollege@bcu.ac.uk

Application Outcome FRDEC DATE:		
Approved	Part Approved	Not Approved
Signed (Associate Dean, Research and Enterprise)		

Appendix 3.1: App Design Prototype Shown to Focus Group Participants







Appendix 3.2: Prototypes Drawn by The Focus Group Participants

Image AP1: Participant-Drawn App Prototype

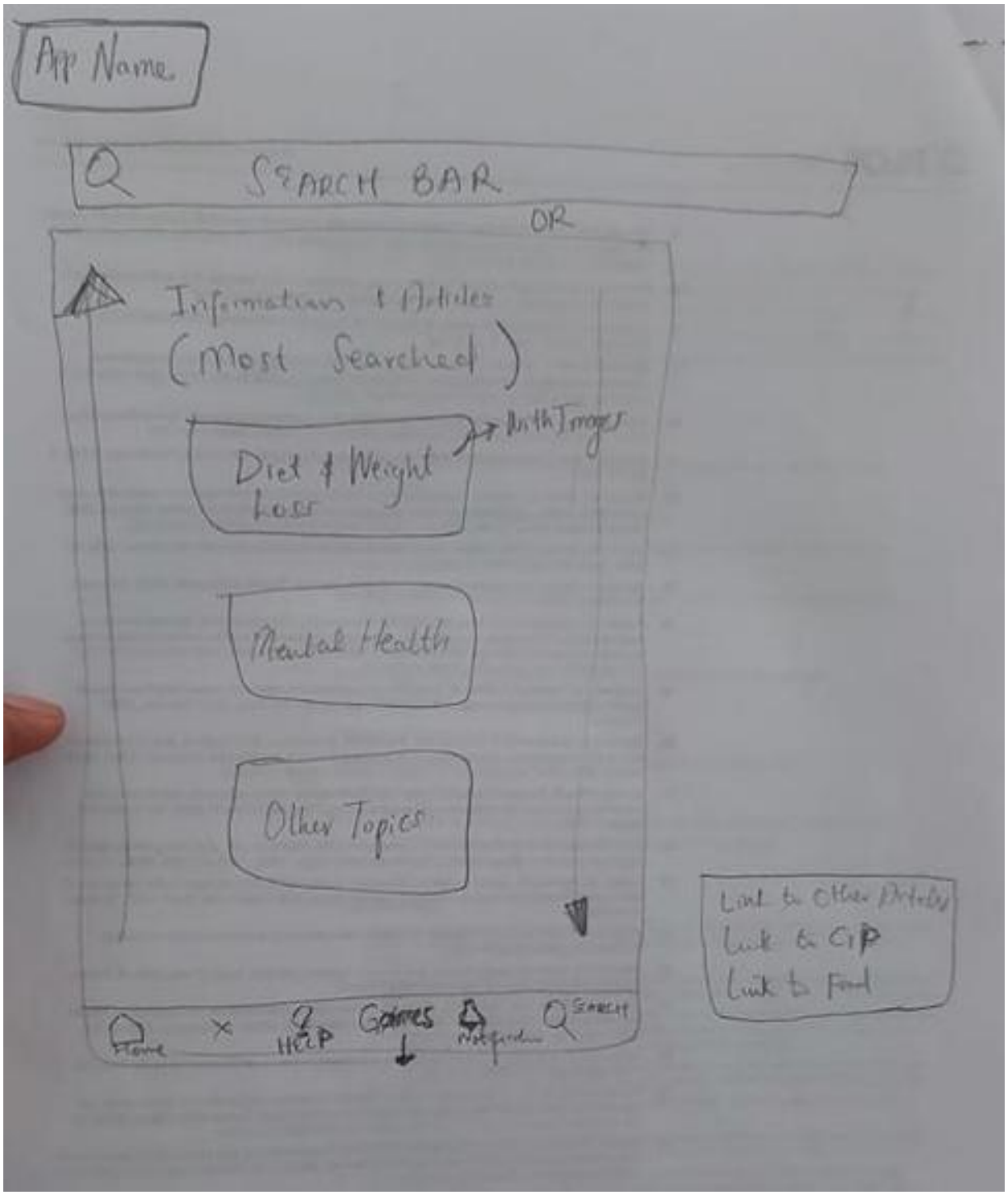


Image AP2: Participant-Drawn App Prototype

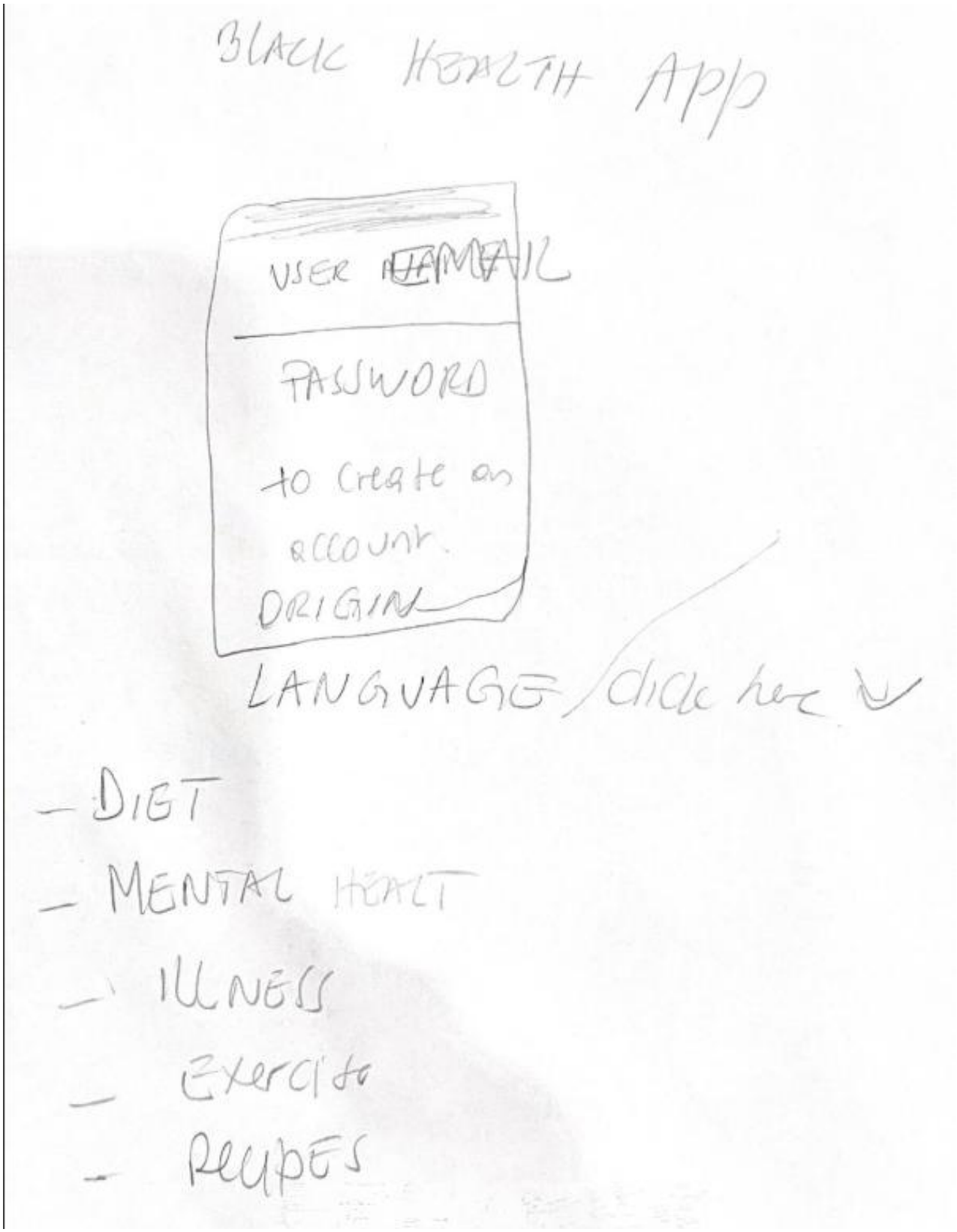


Image AP3: Participant-Drawn App Prototype

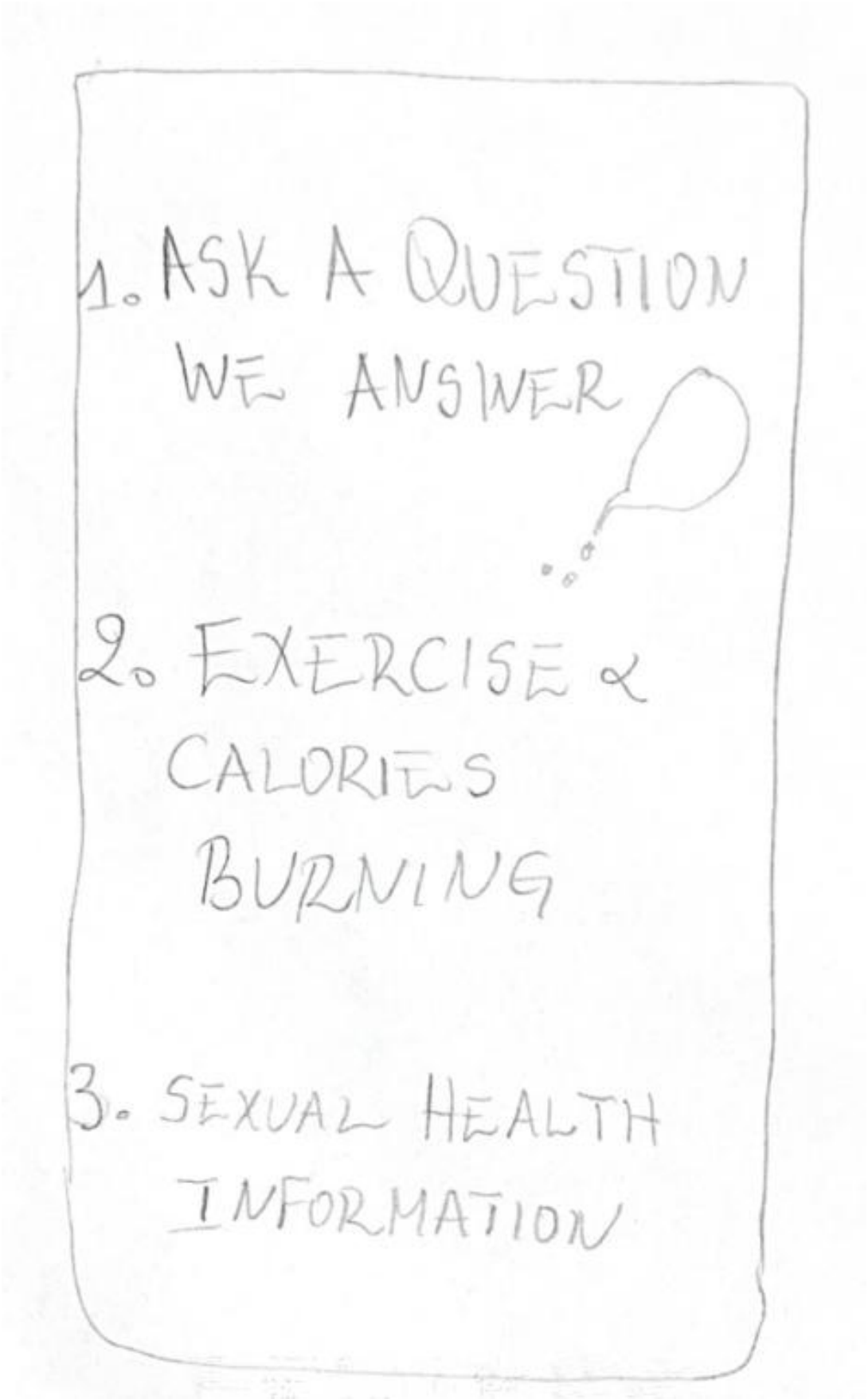


Image AP4: Participant-Drawn App Prototype

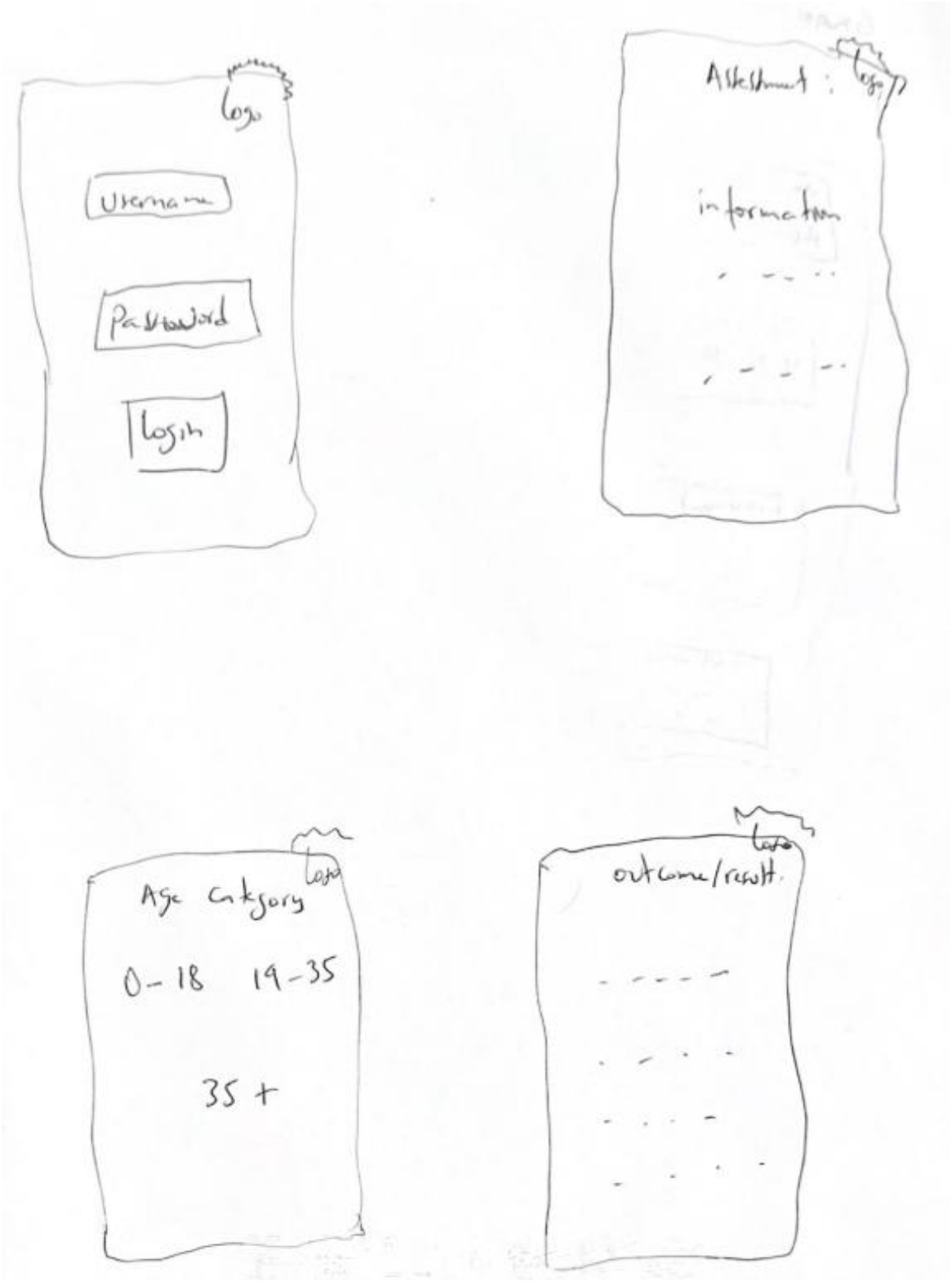


Image AP5: Participant-Drawn App Prototype

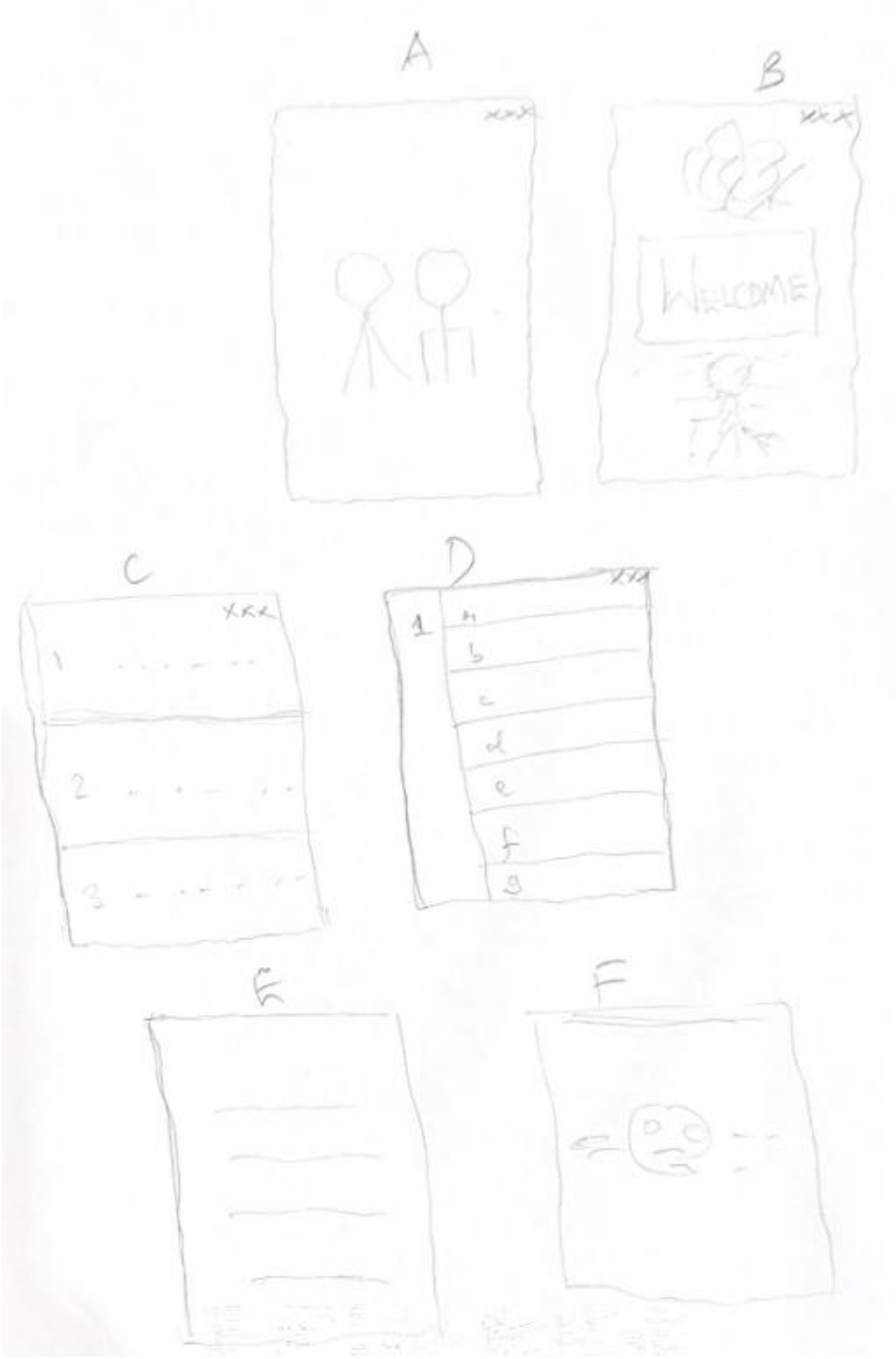


Image AP6: Participant-Drawn App Prototype

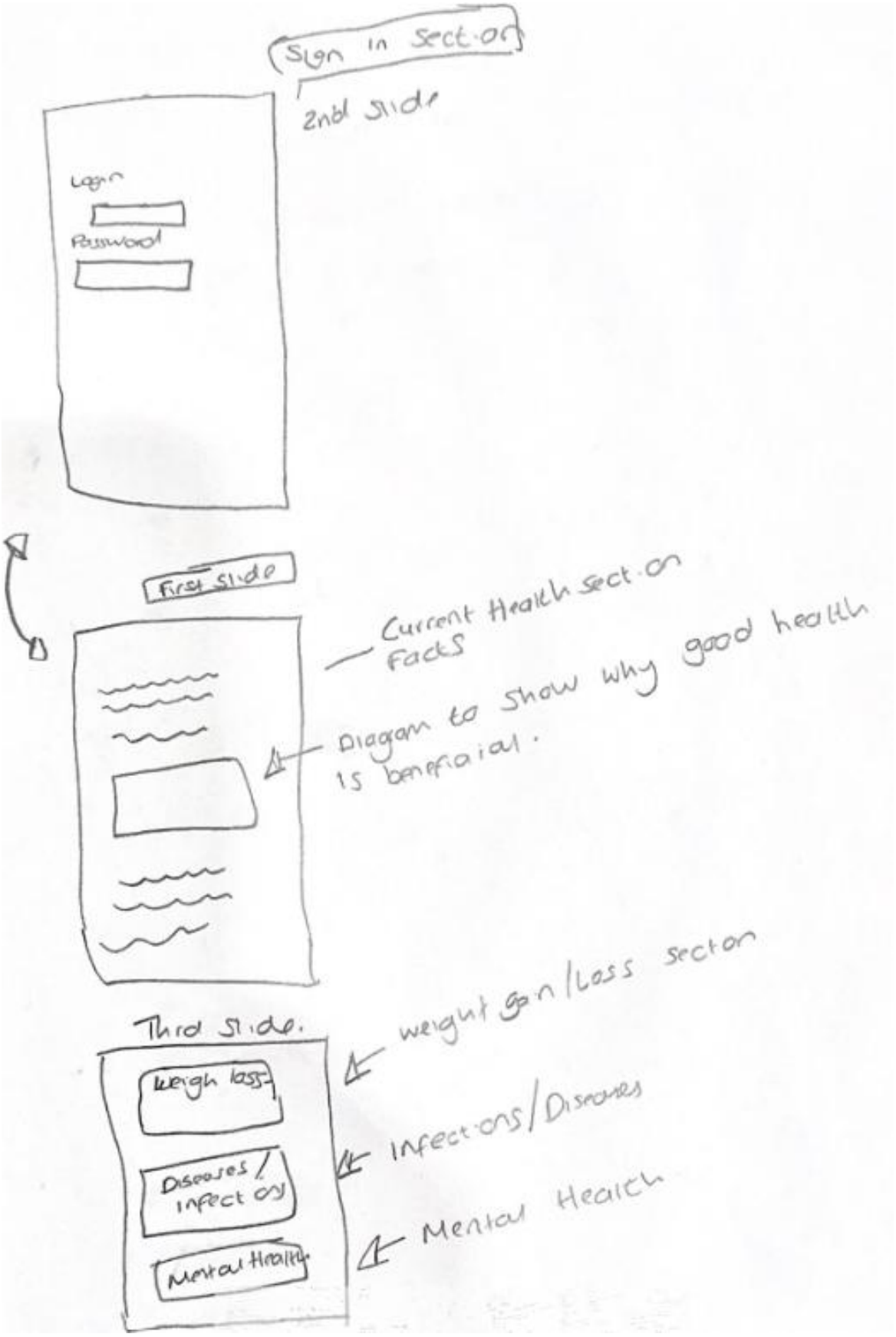


Image AP7: Participant-Drawn App Prototype

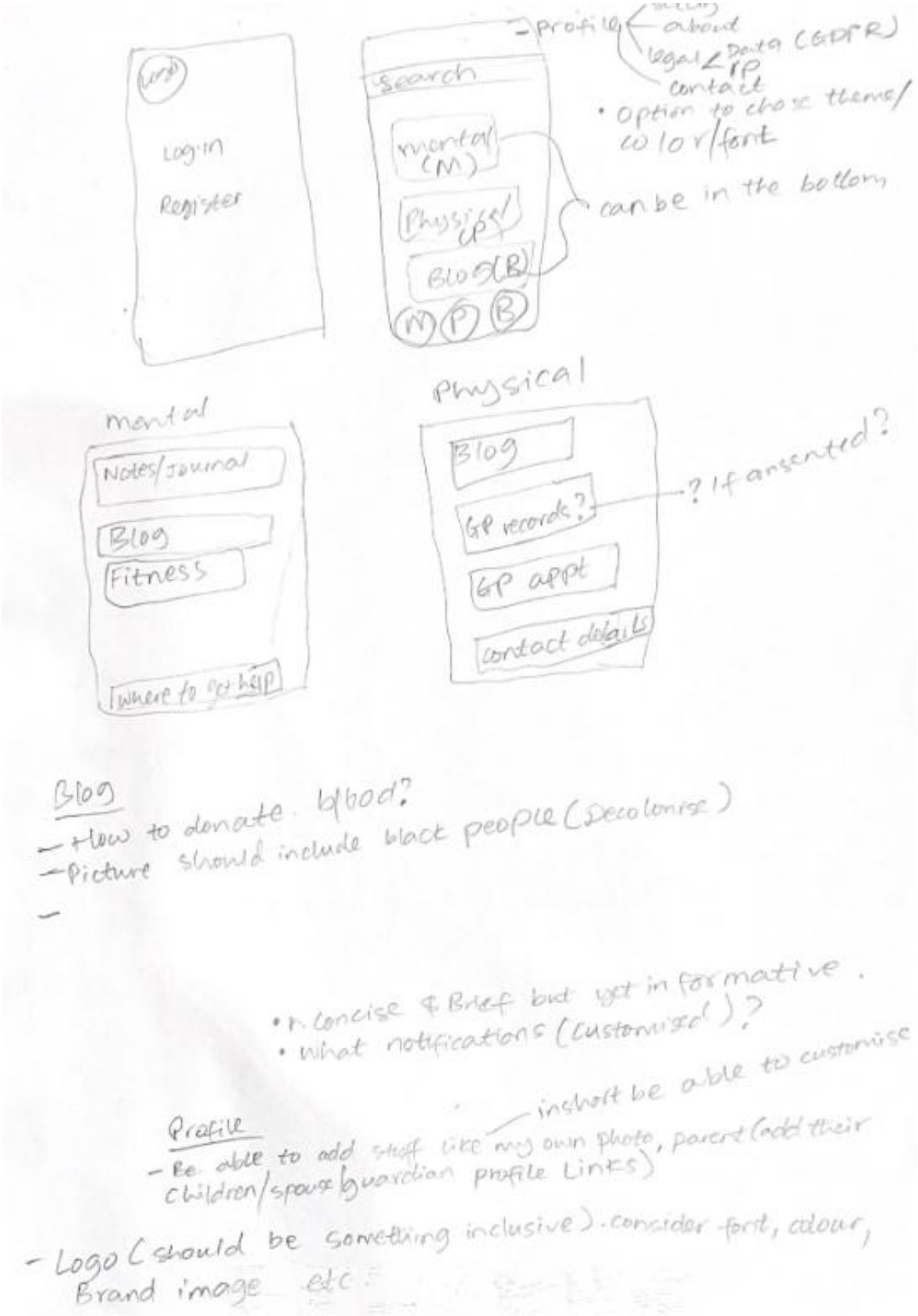


Image AP8: Participant-Drawn App Prototype

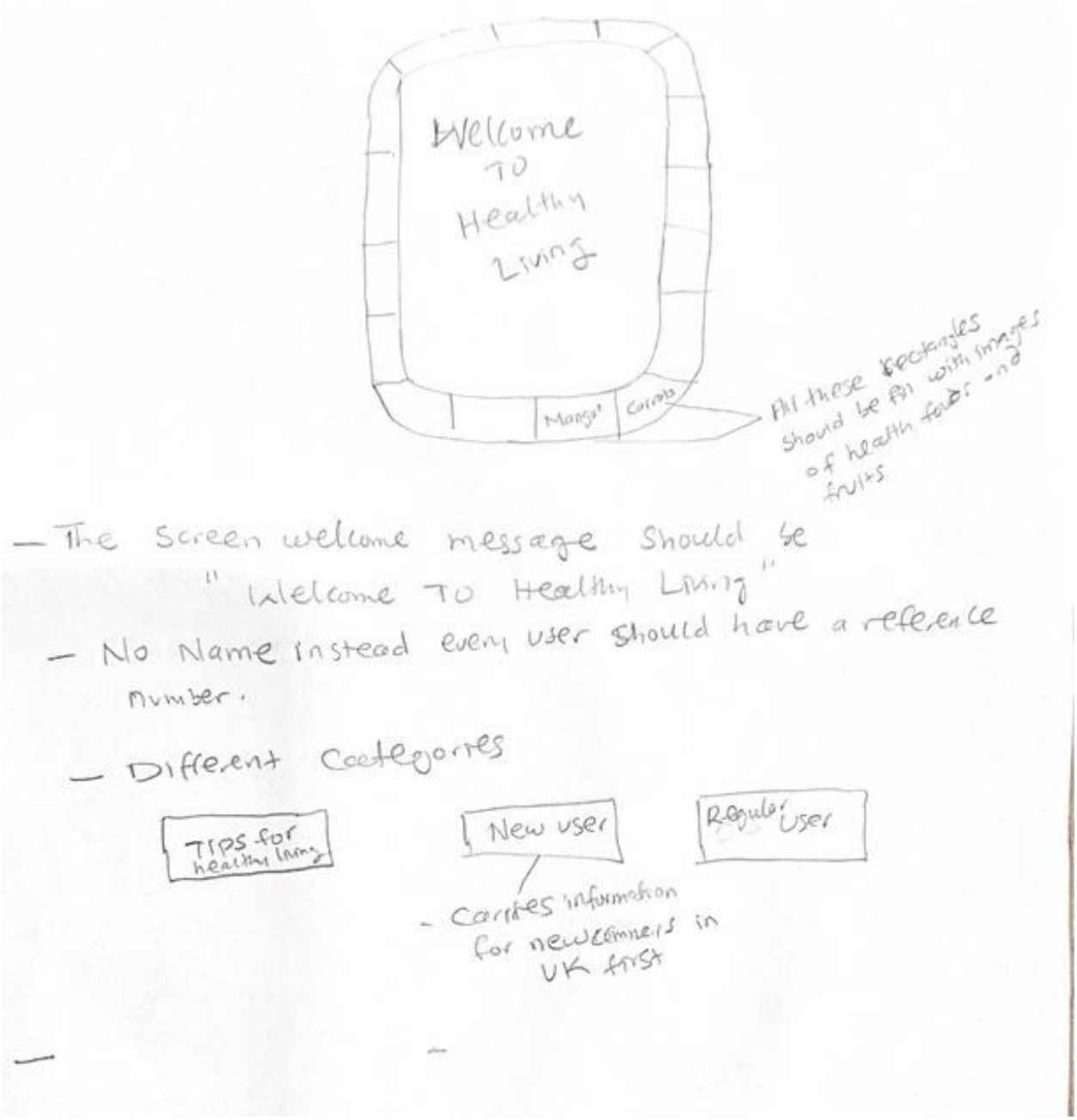


Image AP9: Participant-Drawn App Prototype