

**Policy, Cultural, Social, and
Environmental Barriers to Physical
Activity in the Southern Region of
Saudi Arabia**

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the degree of

Doctor of Philosophy (Public Health)

under the supervision of

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I, Ali Ahmed A Alzahrani, declare that this thesis is submitted in fulfilment of the requirements for the award of Doctor of Philosophy at the School of Public Health, Faculty of Health, at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in this thesis.

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Ethical approval was obtained from the Saudi Arabian Ministry of Health and the Human Research Ethics Committee of the University of Technology Sydney (ETH21-6428 and ETH22-7510 for the first and third studies of this thesis, respectively). Appendix 1 provides the ethical approval documentation from the Saudi Arabian Ministry of Health. Appendices 2, 3, 4, and 5 include the applications for and approvals from the Human Research Ethics Committee at the University of Technology Sydney.

Glossary of acronyms

COVID-19	Coronavirus disease 2019
GCC	Gulf Cooperation Council
MOE	Ministry of Education
MOH	Ministry of Health
NCDs	Non-communicable diseases
PE	Physical education
PHC	Primary Healthcare Centre
PA	Physical activity
RCT	Randomised controlled trial
SPSS	Statistical Package for the Social Sciences
UAE	United Arab Emirates
UK	United Kingdom
USA	United States of America
UTS	University of Technology Sydney
WHO	World Health Organization

Abstract

Physical activity levels in Saudi Arabia remain low, contributing to rising rates of obesity and non-communicable diseases, highlighting the need for effective strategies to promote active lifestyles. This thesis explores the policy, cultural, social, and environmental barriers to physical activity in the Gulf region, with a specific focus on the southern region of Saudi Arabia. Through three interconnected studies, it examines the complexities of physical activity promotion at both the policy and community levels. The first study was a qualitative study with semi-structured interviews with 19 policymakers from Saudi Arabia and Oman, exploring cross-sectoral challenges and facilitators of physical activity (PA) policies. It identified key gaps in policy implementation and intersectoral coordination. The second study was a qualitative study in which 39 PA policy documents from across the six Gulf Cooperation Council (GCC) countries were analysed, providing a comparative overview that highlights policy inconsistencies and the absence of systematic evaluation mechanisms. The third study was based on interviews with 15 participants from diverse backgrounds in the southern region of Saudi Arabia. It offers a qualitative perspective on how local norms, safety concerns, and social expectations shape individuals' engagement in physical activity. One of the key findings was the need for improved collaboration among government sectors, particularly between health, education, municipal, and sports authorities, to effectively promote physical activity. The research highlights insufficient financial support and the lack of dedicated budgets for PA initiatives, which limits the scalability and sustainability of current efforts. Additionally, the findings underscore the importance of developing culturally adapted interventions that are sensitive to local traditions, gender norms, and environmental constraints specific to the southern region. Safety concerns, limited access to appropriate facilities, and social perceptions around physical activity, especially for women, emerged as critical barriers. The thesis contributes valuable insights for policymakers and public health

practitioners by emphasising the importance of context-specific, multisectoral strategies to enhance physical activity participation and reduce health disparities in the region.

Recommendations for future research and policy development are provided to further address the barriers identified and promote a healthier, more active population. Key recommendations include strengthening cross-sectoral collaboration to create more integrated approaches, increasing financial support to ensure sustainable initiatives, and aligning physical activity programs with local cultural norms to foster cultural change and greater community acceptance.

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CHAPTER

1

1 INTRODUCTION

1.1. Overview

Chapter 1 sets the thesis background by discussing physical activity, obesity, chronic illnesses, and their prevalence in the six countries of the Gulf Cooperation Council (GCC: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) and the southern region of Saudi Arabia in particular.

This Chapter also outlines the research questions, the main goal of the thesis, and the specific objectives aimed to achieve this goal. It also highlights the importance of the thesis by discussing its implications for practice and policymaking. Lastly, the chapter provides an overview of the thesis structure.

1.2. Background

1.2.1 Physical inactivity and sedentary behaviour

The World Health Organization defines physical activity as any movement of the body caused by skeletal muscles that involves energy expenditure [1]. Walking, cycling, sports, active recreation and play are all ways to be active, and they may be done by anyone of any ability [1-2]. In addition, household activities, such as cleaning, gardening, carrying groceries, vacuuming, and even doing laundry also contribute to physical activity. Sedentary behaviour is defined as any behaviour with an energy expenditure of less than 1.5 metabolic equivalents (METs) while sitting, reclining, or lying, apart from sleeping. Sedentary behaviours include desk-based office work, driving a car, and watching TV [3-4].

Globally, 41 million people per year die from non-communicable diseases (NCDs) (71% of all deaths), 15 million of these are premature deaths [1]. Physical inactivity and sedentary lifestyle are among the main risk factors for NCDs [5]. Globally, about one in ten deaths is due to physical inactivity [2]. According to Strain et al. (2024), in 2022, around the world 31.3% of people aged 18 and above were insufficiently active (28.7% of men and 33.8% of women) [6]. This means they do not achieve the WHO recommendation of 150-300 minutes of moderate or 75-150 minutes of vigorous-intensity physical activity per week or equivalent combinations of both. Low or declining physical activity levels are

inversely associated with a high or growing gross national product [6]. Part of the decline in physical activity can be attributed to inactivity during leisure time as well as sedentary behaviour at work and at home. In addition, a rise in the usage of passive modes of transportation contributes to a lack of physical activity [7]. According to WHO's 2022 Global Status Report on Physical Activity, in the Eastern Mediterranean Region 81% of school children aged 11-17 years spend less than one hour per day engaging in moderate-to vigorous-intensity physical activity [7]. There are numerous factors that can either help or hinder participation in physical activity. Individual factors, such as motivation, self-efficacy, perceived barriers, and personal preferences, can all have a significant impact on a person's likelihood to engage in physical activity. Environmental factors can also impact on an individual's ability to engage in physical activity. Physical activity can be encouraged by having access to safe and convenient facilities such as parks, bike paths, and fitness centres [7-8].

To increase physical activity levels, systems-based strategies are required, in which stakeholders from different sectors collaborate to create a more active and healthier world. Multi-level actions are required, combining social, cultural, policy, economic, environmental, educational, and informational approaches [9].

1.2.2 Prevalence of physical activity and obesity in Saudi Arabia and GCC countries

While insufficient physical activity is a global problem, it particularly applies to the Middle East and the Gulf region. Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates are the six member states of the Gulf Cooperation Council (GCC), a regional political and economic alliance established in 1981. The GCC aims to enhance collaboration in various areas, including economic development, security, culture, and public health, to address shared challenges and promote collective progress across member states [10-11]. In 2020, the prevalence of physical inactivity among adolescents remained high in the GCC countries: over 80% of teenagers in Oman, Qatar, Bahrain, Kuwait, and the United Arab Emirates were not sufficiently active. Similarly, more than 55% of adults in these countries

were insufficiently active, with 65% of women and 45% of men not meeting recommended physical activity levels. In Saudi Arabia, only 58.5% of adults met the physical activity recommendations, indicating that over 40% were insufficiently active, and 53% of adolescents were physically inactive [12-13].

Similar to insufficient physical activity, obesity rates in the GCC states are among the highest globally. According to the World Obesity Federation, in 2022, the prevalence of obesity among adults was estimated at 50.7% in Qatar, 50.1% in Kuwait, 46.4% in Saudi Arabia, and 44.5% in Bahrain. These rates are significantly higher than the global average and highlight a growing public health concern in the region [14].

1.2.3 Prevalence of physical activity and obesity in the southern region of Saudi Arabia

The southern region of Saudi Arabia consists of four administrative areas: Asir, Najran, Jazan and Albaha. According to the Saudi General Authority for Statistics, in 2021 the population of the southern region in all its administrative areas was 7 million people [15]. The southern region is characterised by the diversity of its terrain with its mountains, plains and coast and contrasts with other regions in Saudi Arabia which are more dominated by desert and a hot climate. In winter, temperatures in the desert regions of Saudi Arabia range from around 10-25°C, while in summer they can soar up to 45-50°C. The southern region is mostly agricultural, and less urbanised than the rest of the country. As well, temperatures in the southern region are significantly lower, especially in the mountainous areas, where winter temperatures can drop to around 5-15°C, and summer temperatures are much milder, ranging from 20-30°C. Mountain ranges in the area make it a suitable place for hiking, rock climbing, mountain biking, and camping, activities not usually possible in other parts of the country, which are mostly desert. Surprisingly, while the climate and natural environment of the southern region are much more suitable to physical activity, research indicates that this region of Saudi Arabia exhibits a notably *higher* prevalence of insufficient physical activity and obesity compared to the rest of the country. Specifically, 72.5% of the population in the southern region are insufficiently physically active, exceeding the national average

of 70.3% [15]. Furthermore, the obesity rate in the southern region stands at 27.6%, compared to 24.7% across other regions [16-17].

Over the last 20 years, due to decreased physical activity and increased consumption of energy-dense products, obesity rates have risen significantly in Saudi Arabia [16]. Saudi Arabia's south is a tribal region that contains 20 different tribes in customs and dialects and has distinct regional aspects such as a unique culture with traditional regional food and variations in obesity-related lifestyles and behaviours like refraining from adopting a Western lifestyle. The southern region, compared to the rest of the Kingdom, contains popular dishes in which honey and bovine ghee (clarified butter) are frequently used and are a sign of hospitality. Such energy dense food contributes to high obesity rates in the region [17].

1.3 Research objectives

The objectives of this thesis are to explore the mechanisms underpinning policy development and implementation by exploring the perspectives and opinions of stakeholders regarding physical activity policies and their implementation in Gulf Cooperation Council (GCC) countries. Additionally, the thesis aims to define and describe the physical activity policy document environment, assess the quality and application of these policies in the GCC region through a comparative analysis based on the framework by Gelius et al. (2021) and the HEPA Policy Audit Tool (HEPA PAT) [18-19]. Furthermore, it seeks to understand how individuals account for their experiences with physical activity in the southern region of Saudi Arabia through qualitative semi-structured interviews conducted with adults from the region. Table 1 summarises the objectives of this thesis, detailing the focus of each objective and the approaches employed to achieve them.

Table 1: Studies, objectives, and approaches of the thesis

Study	Objective	Approach
1	To understand the mechanisms which underpin policy development and implementation.	Qualitative study using semi-structured interviews to identify perspectives and opinions of stakeholders regarding physical activity policies and their implementation in the GCC countries.
2	To define/describe the physical activity policy document environment and assess the quality and application of those policies in the GCC.	Qualitative study based on the approach by Gelius et al. (2021) and the HEPA PAT for physical activity policy monitoring was employed to conduct a comparative analysis of PA policies across all GCC countries.
3	To understand the logics and factors which individuals use to account for their experiences with physical activity in the southern region of Saudi Arabia.	Qualitative semi-structured interviews with the adult population from the southern region.

1.4 Research questions and studies of the thesis

This thesis is structured around two main components: an analysis of physical activity policies in Gulf Cooperation Council (GCC) countries and empirical research on understanding how the people in the southern region of Saudi Arabia conceptualise physical activity (PA) and the reasoning they use to make decisions related to PA. Connecting these two facets, the overarching research questions guiding this integration are as follows:

1. 1) What physical activity policies exist in the six Gulf Cooperation Council countries, how are they developed, implemented and evaluated, and how well do they address the specific jurisdictional

and population contexts of each region? 2) How do the contents and approaches of national physical activity policies in GCC countries intersect with the cultural, social, and environmental factors influencing physical activity in the southern region of Saudi Arabia?; 3) Which factors influence individual's choices and experience of physical activity in the southern region of Saudi Arabia and how are government efforts to promote physical activity viewed by them?

Part 1: Physical activity policies in the GCC countries

In this qualitative research project, the first step was to identify physical activity policy documents in the GCC countries by searching the literature and governmental websites. The second step was to conduct semi structured interviews with policy makers of the Ministries of Health, Sport and Education of GCC countries. In the interviews the stakeholders' views of the environment, initiatives, strengths, weaknesses, and barriers to existing policies and their implementation was examined. Moreover, conducting interviews served the purpose of identifying additional policy documents related to physical activity in the Gulf region. In step 3, the policy documents were analysed using the HEPA Policy Audit Tool [20], in line with the approach taken by Gelius et al. who analysed physical activity policies in four EU countries [18]. We answered the following questions for the first and second studies, which focus on physical activity policies in the Gulf region:

1. What national physical activity policies/plans are in place in the Gulf countries?
2. What are the contents of the national physical activity policies/plans in each GCC country?
3. What are the strengths of different sectors in delivering physical activity policies in the GCC?
4. What are the challenges in developing and delivering policies relevant to physical activity from different sectors in the GCC?
5. How are physical activity policies currently being implemented and delivered? Is there any monitoring to assess whether they are being delivered as intended?

6. What opportunities exist for developing better physical activity policies in the future in this region?

Part 2: physical activity in the southern region of Saudi Arabia

This part was a qualitative study in which data were collected to explore factors and influences on individuals physical activity in the southern region of Saudi Arabia. We conducted semi-structured interviews to better understand the experiences, perspectives, and limitations faced by individuals in the southern region of Saudi Arabia regarding physical activity. These interviews provided valuable insights, allowing us to delve into the specific factors that hindered and assisted people in engaging in physical activity in this region. The results aim to answer the following questions:

1. How do people in the southern region of Saudi Arabia account for their own and others' experiences of physical activity?
2. Do the accounts that people in Southern Saudi Arabia refer to more system level barriers (policy, institutional, interpersonal), such as lack of access to facilities, cultural and environmental factors, or are they more "individually" located such as motivations, fear of injury, low self-confidence, or negative self-talk? [21-22].
3. How do people overcome the limitations of these factors to meet their physical activity goals? What is the potential of physical activity policies in the southern region of Saudi Arabia to promote physical activity in the region in light of people's experiences?

This thesis is composed of three interrelated studies, each designed to address specific aspects of physical activity policies and experiences in the Gulf Cooperation Council (GCC) countries, with a particular focus on the southern region of Saudi Arabia. The first study examines the mechanisms underpinning the development and implementation of physical activity policies in the GCC countries. Using semi-structured interviews, this study explores the perspectives and opinions of key stakeholders, including

policymakers from Saudi Arabia and Oman. The second study focuses on the physical activity policy environment in the GCC countries. Employing a comparative analysis framework based on the approach by Gelius et al. (2021) [18] and the HEPA Policy Audit Tool (HEPA PAT) [20]. This study evaluates the quality, scope, and application of physical activity policies. By systematically assessing policy documents, the study identifies gaps, strengths, and areas for improvement in the policy landscape across the region. The third study delves into the lived experiences of adults in the southern region of Saudi Arabia regarding physical activity. Semi-structured interviews were conducted to capture personal accounts, uncovering cultural, social, and environmental factors that shape physical activity behaviours. This study provides a nuanced understanding of the challenges and motivations individuals face, contributing to the broader context of regional physical activity promotion. By integrating these three studies, the thesis offers a multi-level analysis that bridges policy, systemic, and individual perspectives.

1.5 Significance

The thesis will make an important contribution to the field of physical activity and public health in the Gulf region, specifically by examining whether physical activity policies and their implementation are fit for purpose in the GCC countries, a region with some of the lowest rates for physical activity and some of the highest rates for obesity in the world [23-24]. It also explored the opinions and perspectives of different stakeholders in the GCC countries regarding the promotion of physical activity. The second part of the study investigated how the people in the southern region of Saudi Arabia conceptualise physical activity (PA) and the reasoning they use to make decisions related to PA. The integration of physical activity policy analysis with the barriers and facilitators aims to explore how policy measures can effectively address and overcome the identified obstacles, while simultaneously enhancing the enabling factors for physical activity participation. In addition, I have applied the Socio-Ecological Model (SEM)[22] to look beyond individuals and examine the cultural, environmental, and policy contexts that influence physical activity behaviours. This comprehensive approach allows for the development of

targeted strategies to promote physical activity and tackle specific barriers within Saudi Arabia, particularly in the southern region. By analysing the existing policies, identifying gaps, and formulating appropriate recommendations, the aim is to create an environment that fosters and supports increased physical activity levels, ultimately leading to improved health and well-being in the region.

1.6 Thesis structure

In accordance with the thesis-by-compilation format agreed upon with my supervisors, this document includes both traditional thesis chapters (Chapters 1, 2,3,7 and 8) and chapters that consist of published or submitted works (Chapters 4, 5, and 6). Each published or submitted work is fully integrated as an individual chapter, complete with its own references.

1.6.1 Chapter outlines

This thesis is organised into eight chapters.

Chapter 1: Introduction

Chapter 1 provides the thesis background, discussing physical activity, obesity, chronic illnesses, and their prevalence in the GCC countries and southern Saudi Arabia. It outlines the research questions, study goals, specific objectives, and the research's implications for practice and policymaking, and concludes with an overview of the thesis structure.

Chapter 2: Literature review

This chapter reviews the literature on various aspects of physical activity, including the promotion of physical activity, behaviour change theories, the policy cycle framework, and Eight Best Investments for

Physical Activity of the International Society of Physical Activity and Health as they apply to Saudi Arabia.

Chapter 3: Research methods

Chapter 3 outlines the research methods used in this thesis, highlighting the three studies that led to the production of three research papers.

Chapter 4: study I: Physical activity policies in Saudi Arabia and Oman: A qualitative study using stakeholder interviews

This chapter includes the first published paper titled 'Physical activity policies in Saudi Arabia and Oman: A qualitative study using stakeholder interviews'.

Chapter 5: Study II: Physical activity policies in the Gulf Cooperation Council countries: A qualitative study with document analysis

This chapter features a research paper that examines physical activity policies across the six Gulf Cooperation Council countries: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE.

Chapter 6: Study III: Understanding physical activity in the southern region of Saudi Arabia

This chapter includes an in-depth study on understanding physical activity in the southern region of Saudi Arabia, exploring the various challenges faced by individuals and communities in adopting and maintaining an active lifestyle.

Chapter 7: Discussions

This chapter synthesises the key findings from the three studies presented in this thesis, providing a comprehensive interpretation of how policy, cultural, social, and environmental factors influence physical activity in the Gulf region, particularly in the southern region of Saudi Arabia.

Chapter 8: Conclusion, recommendations, and future directions

Chapter 8 provides a comprehensive summary of the key findings from the research, highlighting the implications for public health and policy. It also offers practical recommendations for enhancing physical activity initiatives and addressing the identified barriers. Additionally, the chapter outlines potential future research directions and areas for further investigation to build on the study's contributions.



2 LITERATURE REVIEW

2.1 Overview

Physical activity is a cornerstone of public health, playing a crucial role in preventing chronic diseases and promoting overall well-being [7]. In recent years, there has been a growing recognition of the need for effective strategies and policies to enhance activity levels, particularly in regions like Saudi Arabia where rates of insufficient physical activity and obesity are particularly high [25]. This chapter provides a comprehensive review of the existing literature on physical activity, with a particular focus on its promotion, the application of behaviour change theories, and the utilisation of the policy cycle framework. It also delves into the Eight Best Investments for Physical Activity of the International Society for Physical Activity and Health (ISPAH), exploring how these strategies have been implemented within the context of Saudi Arabia.

Through a literature review, this chapter aims to identify and highlight gaps in the current research, particularly in how these frameworks and theories have been adapted to or applied in the Saudi Arabian context. This analysis will serve as a foundation for understanding the current state of physical activity promotion and the associated policy environment in Saudi Arabia, thereby guiding future research and policy development in this critical area.

2.2 The promotion of physical activity

2.2.1 Introduction

The health benefits of physical activity go beyond primary prevention, and can add up to 14 years to a person's life expectancy compared to those that are not physically active [26]. Globally, insufficient physical activity is estimated to cost US\$ 47.6 billion per year [27]. In Saudi Arabia, the average annual economic loss of healthcare costs is projected to range between US\$5.4 billion and US\$7.6 billion through 2040 [28]. Around the world, in recent years, physical activity promotion and the formulation of appropriate policies have received a lot of attention from various stakeholders, including governments, public health organisations, and researchers [29]. Interventions to promote physical activity have been

conducted in different settings and populations such as health care settings and workplaces [30-31]. In addition, the promotion of physical activity has targeted the general population and subgroups with specific health conditions [32-33]. In Saudi Arabia various obstacles hinder the success of physical activity initiatives to bring about population-level change. Two of the biggest challenges are the desert environment and the very hot climate. As well, due to the country's vast geography and non-existent public transport, there is limited access to recreational facilities, especially in remote and underserved areas. Therefore, in section 2.4 I discuss the potential of physical activity interventions in Saudi Arabia based on the Eight Best Investments that Work for Physical Activity, provided by the International Society for Physical Activity and Health (ISPAH) [9].

2.2.2 Behaviour change theories for physical activity

As a large proportion of the world's population is insufficiently physically active [24], effective promotion strategies for physical activity are required. Therefore, behaviour change theories are necessary for understanding physical activity and providing a theory-based framework to guide effective interventions [34]. Over the last three decades several theoretical frameworks have been used for the promotion of physical activity. Social cognitive, humanistic, dual process theories and the socioecological model are four key frameworks [35] which are briefly outlined below. These frameworks were chosen based on the comprehensive review by Rhodes et al. (2019) [35], which identified them as foundational in shaping physical activity research and interventions. Rhodes and colleagues determined these frameworks by evaluating their theoretical robustness, empirical support, and applicability across various contexts. By adopting these frameworks, this study leverages well-established theories to analyse physical activity promotion while recognising that no single framework fully encapsulates the complexities of behaviour change. This selection reflects an effort to integrate diverse perspectives and address potential limitations inherent in any singular theoretical approach.

The social cognitive theory is founded on the idea that people build expectations about behavioural events and outcomes and then act on them [36]. That is, people want to be physically active if they

believe it is important and if they are physically capable of doing so. In the humanistic framework, people are naturally driven to grow, develop, and reach their full potential, which influences their behaviour [37]. Basic psychological needs theory (BPNT) and organismic integration theory (OIT) are two extensively utilised theories in the humanistic framework that have been used to investigate physical activity behaviour [35]. These theories argue that individuals with self-determined motivation are more likely to have higher levels of physical activity, health, and general well-being than those with extrinsically managed or without motivation [35].

Individual level behavioural factors are mapped onto one of two types of impact - reflective or automatic processes in dual process frameworks [35]. The framework also contains social-cognitive variables, such as values, expectations and intents, as well as non-conscious processes such as habits, automatic assessments and automatic self-schemas [38]. However, when more evidence of consistent linkages between nonconscious processes and physical activity behaviour became available, this theory evolved further [39]. Strobach et al. (2020) explained the processes of the dual framework in which intention, trait self-regulation, and executive functions are examples of explicit processes, whereas emotional processes and habit formation are examples of implicit processes. They also stated that these processes not only have direct, but also moderating and interacting effects on physical activity initiation and maintenance [39].

The socioecological framework is predicated on the idea that behaviour is the consequence of direct, indirect, and interacting influences from a variety of sources, ranging from the individual to the environment and social policy [22]. Consequently, the socioecological model's application to physical activity has largely concentrated on the level of environmental settings [34]. Schools, urban design, parks, and recreation facilities are examples of settings-based interventions guided by the socioecological framework where governments can intervene [40].

This thesis is based on the social-ecological model (SEM), which posits that health behaviour, such as physical activity, is shaped by individual (e.g., age, gender, attitudes), interpersonal (e.g., social support, norms), environmental (e.g., access, safety), and policy factors (e.g., regulations). These

interrelated factors underscore the importance of implementing multi-level interventions to enhance the promotion of physical activity [8, 22]. SEM is particularly useful because it emphasises the dynamic interaction between these multiple levels, enabling a more comprehensive understanding of behaviour change. Research has shown that interventions addressing multiple levels of influence are more effective at improving physical activity outcomes than those targeting individual factors alone [45]. For instance, Bauman et al. (2012) highlighted that strategies combining policy changes with supportive environments and individual-level programs lead to sustained improvements in physical activity participation [8].

Given the significant impact of physical activity policies on promoting physical activity within the social-ecological framework, the first part of this doctoral thesis focuses on examining physical activity policies in the Gulf countries. The goal was to identify how these policies influence the barriers to physical activity in the Gulf region, and Saudi Arabia. This was achieved through conducting qualitative interviews with policymakers in Saudi Arabia and Oman and through analysing policy documents related to physical activity in all six GCC countries. Evidence from global studies demonstrates that well-designed policies can effectively address barriers to physical activity and create environments that encourage active lifestyles. For instance, the WHO Global Action Plan on Physical Activity (2018) underscores the role of national and local policies in increasing physical activity levels through initiatives such as urban planning, school-based programs, and workplace interventions [41]. Similarly, research by Bull et al. (2020) shows that countries with comprehensive physical activity policies report higher participation rates and improved health outcomes. These findings highlight the transformative potential of policy-driven interventions to promote physical activity at a population level [42]. In Saudi Arabia, particularly in the southern region, social norms and attitudes are identified as external barriers significantly influencing the participation of various social groups, including men and women, in physical activity [43-44].

2.2.3 Evidence based interventions for physical activity promotion

Over the last three decades, the focus of public health around the world has shifted from approaches almost entirely dominated by pure healthcare to more primary prevention, encompassing programs aimed at injury prevention and control as well as the prevention and management of chronic illnesses [45]. Community-based informational, behavioural, social, policy, and environmental approaches are now prominent in attempts to improve physical activity in whole communities [45]. According to Heath et al. (2002), the domains provided by the Guide to Community Preventive Services were used to classify intervention techniques. Physical activity interventions were classified into three domains: 1) campaigns and informational interventions, 2) behavioural and social interventions and 3) environmental and policy interventions [46]. The effectiveness of these interventions has been evaluated in various empirical studies. For example, systematic reviews and meta-analyses have shown that informational and campaign-based interventions, such as mass media campaigns, can lead to modest but significant increases in physical activity levels across populations, particularly when paired with other strategies [46-47].

In terms of campaigns and informational interventions, community-wide campaigns are one of the recommended strategies to increase population levels of physical activity [46]. These campaigns are examples of large-scale, high-intensity, and high-visibility programs, frequently employing radio, television and social media platforms to increase awareness and to communicate targeted health messages to certain subgroups of the population [48].

The goal of behavioural and social interventions is for individuals to incorporate physical activity into their everyday routines through a multicomponent intervention approach. Social support, and self-rewarding behavioural reinforcement, systematic problem-solving, and relapse prevention are examples of this kind of intervention [49]. Physical activity counselling initiatives can also play a role in promoting physical activity. Oloo and colleagues (2020) stated that counselling provided by health professionals is likely to result in better physical activity outcomes for patients with various illnesses [50].

By contrast, environmental and policy interventions can be achieved through building of walking and biking trails and exercise facilities, by improving neighbourhood walkability, by lowering structural and environmental barriers, and by improving access to existing facilities [51-52]. For instance, Stride et al. (2017) concluded that outdoor gyms could be a cost-effective way to get older people to participate in a variety of exercises [53].

The goal of the public health sector in terms of urban design and land-use regulations, policies, and practices is to create communities that are enjoyable to live in. These interventions make use of policy instruments, such as zoning restrictions and building requirements, as well as modifications of environmental policies. Policies can promote physical activity friendly environments by addressing street layouts, density of developments, and the proximity of retailers, workplaces, and schools to people's homes [54]. Furthermore, ease of access to a range of destinations, perceived neighbourhood aesthetics, pedestrian-friendliness, and safety can enhance the positive effects of mixed-use neighbourhoods on residents' physical activity [55].

It is worthwhile to explore how policies might support these interventions, as they provide a framework for scaling and sustaining these efforts [41]. Policies can institutionalise successful interventions, allocate resources effectively, and ensure that environments are conducive to physical activity. This alignment between policy and intervention strategies can enhance the overall impact on public health, even if individual studies occasionally exhibit methodological limitations. By critically evaluating and leveraging this evidence, this thesis underscores the potential of a policy-driven approach to advancing physical activity promotion.

2.3 Physical activity policies and the policy cycle framework

2.3.1 Definitions and examples

Public health approaches to health promotion and disease prevention have traditionally included policy and environmental interventions [56]. Any legislative or regulatory action taken by governments, government agencies, or nongovernmental organisations, such as schools, workplaces, or health settings, is referred to

as policy [56]. Policy encompasses both formal and informal regulations, as well as explicit and implicit design standards [56]. Policies can be established based on three levels, each of which reflects governmental and political commitment. These levels are formal written regulations and legislations, guidelines for policy implementation, and unwritten social norms that have an impact on behaviour [56]. Policy frameworks allow for the organisation of policies and the identification of policy gaps [57]. Frameworks have been used to help improve physical activity policy research and monitoring of policy implementation [58]. For example, Schmid et al. (2006) developed a framework to conceptualise and organise physical activity policy interventions [56]. As shown in Figure 1, in this framework, three axes (policy, sector, and scale) illustrate the components of physical activity policy. Figure 1 is from Schmid et al. (2006), providing a clear depiction of the multidimensional approach to physical activity policy [56].

Physical Activity Policy Framework

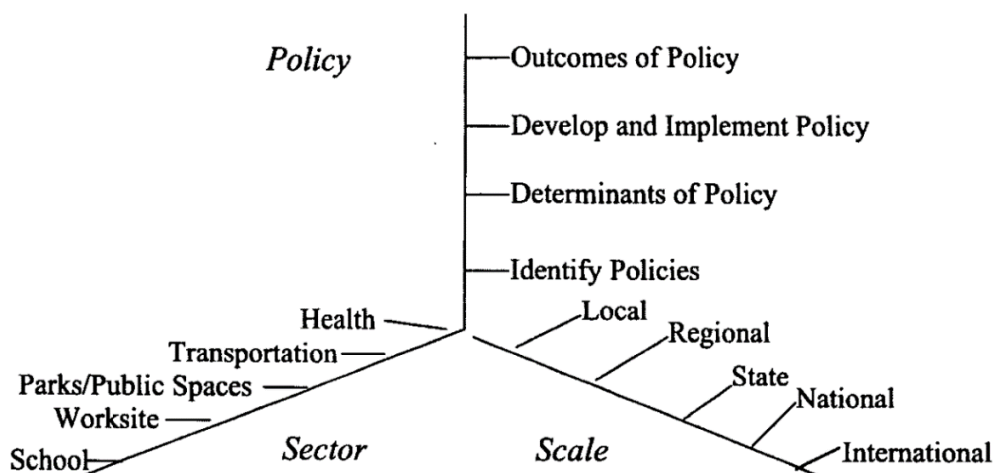


Figure 1: A conceptual framework for public policy relevant to physical activity [56]

Another example of a policy framework for physical activity is the MOVING framework that was developed by the World Cancer Research Fund as a part of the EU's CO-CREATE initiative. This policy

framework is focused on increasing physical activity and exercise and emphasises the value of policy measures in four areas: Active Societies, Active Environments, Active People, and Active Systems [59].

2.3.2 Policy cycle framework and physical activity

In public policy as well as public health policy, the use of the policy cycle framework and related stages is popular. The objective of the policy cycle framework is to organise and order the complexity of policymaking [60]. It was first introduced in 1956 by Lasswell [61], the father of modern policy analysis and public policy, and it is currently still considered one of the most important concepts in policymaking [60]. As illustrated in Figure 2, the policy cycle is composed of five stages: 1) agenda setting, 2) formulation, 3) decision-making, 4) implementation, and 5) evaluation [60].

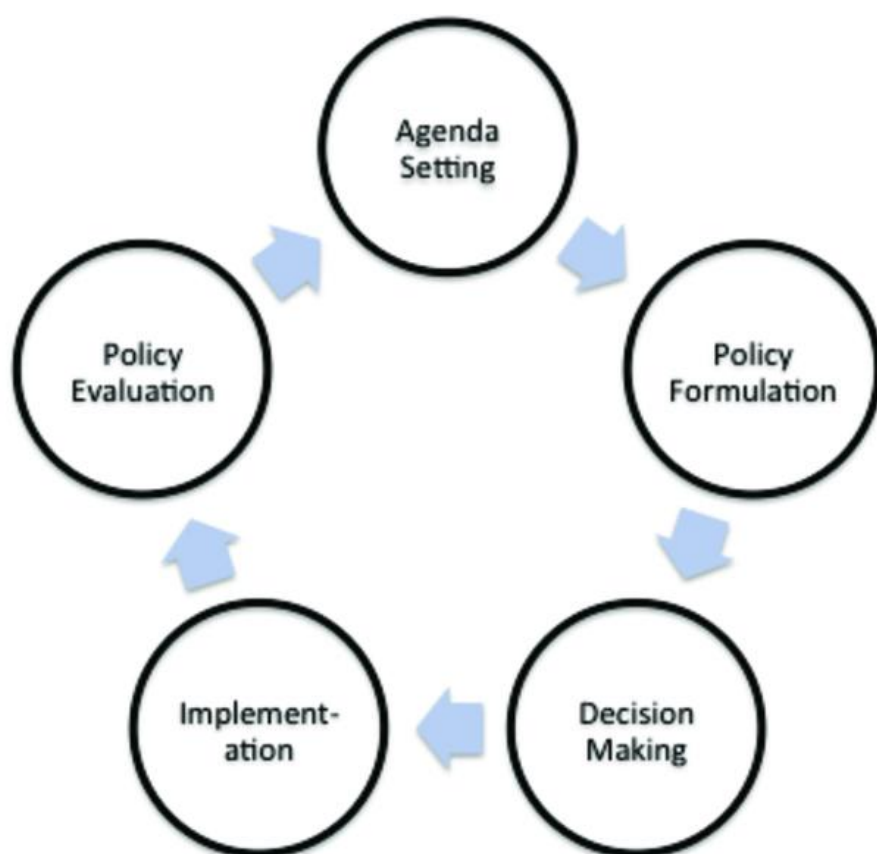


Figure 2: The policy cycle model (after Howlett and Ramesh (1995))

Any kind of policy in any organisation is supposed to follow the policy cycle to achieve the best outcomes, including physical activity policies. The role of national policy in addressing population levels

of physical inactivity has been emphasised more recently [62]. For instance, Milton and Bauman observed a shift in England's physical activity policy, indicating the challenges associated with adopting and sustaining such policies in the midst of political changes. The policy changes and cycles highlight the difficulties encountered in maintaining consistent physical activity policies over time. This shift in policy demonstrates the need for continuous efforts and adaptability to overcome barriers and ensure the long-term effectiveness of physical activity initiatives. By understanding these challenges, policymakers can work towards developing strategies that can withstand political changes and promote sustained physical activity promotion [62]. Examples of such strategies include establishing cross-sectoral partnerships that integrate physical activity goals across health, education, and urban planning sectors; creating stable funding streams that support PA programs independently of political shifts; and implementing evidence-based policies with built-in evaluation mechanisms to measure outcomes and refine approaches over time [62].

Furthermore, Gelius et al. (2021) found that the policy cycle framework, along with the HEPA PAT (Health-Enhancing Physical Activity Policy Audit Tool), provided a comprehensive and systematic approach for evaluating and understanding the development, implementation, and evaluation of physical activity policies. This framework enabled a thorough examination of physical activity policies in the selected European countries (Germany, Ireland, the Netherlands and Poland), providing valuable insights for policymakers and researchers in shaping effective strategies for promoting physical activity [18]. In addition, a study by AlMarzooqi et al. (2023) highlights the need to address the challenges and barriers that impact the sustainability of policies and initiatives in Saudi Arabia. Adopting a systems-based approach can help leverage synergies across sectors, thereby accelerating progress in promoting physical activity among the Saudi population [63].

The HEPA PAT framework [19] aligns with the conceptual framework for public policy proposed by Schmid et al. (2006) [56] in its multidimensional approach to analysing physical activity policies. Both frameworks emphasise the importance of addressing various levels and sectors involved in policy development and implementation. While Schmid et al.'s (2006) framework focuses on the axes of policy,

sector, and scale to illustrate the components of physical activity policy, the HEPA PAT operationalises these concepts by providing specific tools and criteria for assessing the comprehensiveness and effectiveness of policies. This alignment underscores the relevance of both frameworks in offering a structured and systematic methodology for advancing the field of physical activity policy research. However, they concluded that while national governments are already quite active in the health and sport sectors in terms of physical activity policy, there still is room for improvement in other sectors such as education, transport and tourism [18].

2.4 Applying ISPAH's Eight Best Investments for Physical Activity to Saudi Arabia

The International Society for Physical Activity and Health (ISPAH) published an evidence-based overview of the eight best investments for promoting physical activity: 1) whole-of-school programs, 2) active transport, 3) active urban design, 4) healthcare, 5) public education including mass media, 6) sport and recreation for all, 7) workplaces, and 8) community-wide programs [9]. The strength of evidence supporting these investments varies. For instance, whole-of-school programs and active urban design are supported by robust evidence from systematic reviews and meta-analyses, demonstrating their significant impact on increasing physical activity levels across diverse populations [64-65]. Investments in healthcare and public education, including mass media campaigns, show moderate evidence, with their effectiveness often dependent on implementation quality and integration with broader strategies [49, 66]. Meanwhile, community-wide programs and workplace interventions have emerging but promising evidence, highlighting their potential to influence physical activity when implemented alongside supportive policies and environmental changes [30-31]. As previously mentioned in the introduction of the literature review, numerous obstacles hinder the effectiveness of physical activity initiatives in Saudi Arabia, thereby impeding population-level change. Consequently, I provide a detailed discussion of the potential of physical activity interventions in Saudi Arabia, with a specific focus on the eight best investments from the International Society for Physical Activity and Health (ISPAH). Below, I will discuss each of these investments in the Saudi Arabian context.

2.4.1 Whole-of-school programs

Whole-of-school physical activity programs in general involve regular, high-quality physical education sessions that provide appropriate physical environments and resources to encourage both structured and unstructured physical activity throughout the day [9]. In recent years, in Saudi Arabia some initiatives and programs have been established through the Ministry of Education to promote physical activity in schools and universities. Health-Promoting Schools is a program that has been widely implemented in the country. The Healthy School is a place where all members of the school community, including students, parents, teachers, and administrators, collaborate to improve student health. The Healthy School program provided various sporting activities and healthy food [67].

Another initiative is the health-enhancing physical activity program which was established by the Ministry of Education for public schools. This program aims to promote a healthy lifestyle for students in public schools by improving dietary habits, increasing physical activity, and raising awareness of obesity complications. Recently, the School Sports Strategy was launched by the King Abdullah Program for Education Development which intends to promote physical activity in schools by offering easily accessible playgrounds and venues [25]. The RASHAKA program, which means “fitness”, is one of these initiatives. RASHAKA was a collaborative program that was run from 2017 until 2020 by the Ministry of Education (MoE) and the Ministry of Health (MoH) to tackle obesity among school students [68-69]. The project aimed to improve school environments by offering healthy food options (fruits, vegetables, whole-grain bread, etc.) in school cafeterias and prohibiting the sale of high-energy (high fat and sugar) snacks and beverages. Moreover, the RASHAKA initiative evaluated the students’ health conditions (including BMI measurement by a professional nurse) and the families' medical history (chronic illnesses such as diabetes and hypertension) to screen for obesity and its complications [68]. In 2018, a new program was initiated by the Ministry of Education in which for the first time physical education was included in the curriculum in girls’ schools [25].

2.4.2 Active transport

Policies that promote active transport (walking and cycling, also as a part of using public transport) can be effective in promoting physical activity on the population level [70]. In Saudi Arabia, active transport is somewhat restricted due to a lack of infrastructure, lack of decent public transport, the climate with extremely hot weather in most of the country, and the huge land area of more than 2.15 million km² with low population densities in many settlement areas which is associated with large travel distances [25, 71]. Saudi Arabia has little experience with public transportation, except for the Saudi Public Transport Company (SAPTCO) in the capital Riyadh, which ended operation of buses in 1992 [71]. In the Saudi national transportation strategy not one of the six strategic goals mentions the integration of physical activity through walking, cycling or the use of public transport [72]. Therefore, in the short to medium term it is unlikely that active travel will be used to address population levels of physical activity. However, in Riyadh, the capital of Saudi Arabia, the Riyadh Metro began operating in the last quarter of 2024. While it represents a significant public transport initiative, it may take time to evaluate its impact on residents' physical activity levels and its potential role in promoting active travel.

2.4.3 Active urban design

According to the United Nations, 2007 was the first year in which more people lived in cities than in rural regions [73]. Many studies have shown that people who live in walkable neighbourhoods are more physically active and less likely to be obese than those living in less activity-friendly neighbourhoods [74-75]. In Saudi Arabia, the Ministry of Municipal and Rural Affairs and Housing is responsible for urban design. Many projects and activities have been implemented by municipalities across the country to improve the quality of life of Saudi citizens by constructing more parks, footpaths, and communal recreational places. Moreover, walking trails and playgrounds have been built by municipalities in different cities across the country [76]. Notably, in Riyadh, the construction of a mega project known as the 'Sports Boulevard', a 135 km linear park, began several years ago. Designed to enhance walkability, promote cycling, and encourage recreational physical activity among residents, it represents a significant

step toward creating a more active urban environment [77]. Regardless of these initiatives, some barriers in Saudi Arabia can prevent a transformation to a more active urban design such as lack of coordination between stakeholders in the Ministry of Municipal and Rural Affairs and the Ministry of Transport [71]. As well, outdoor recreational and sports activities are limited in many parts of Saudi Arabia, particularly during the summer months (June to August), due to the hot weather, which can reach up to 50°C. Nevertheless, the contemporary urban design in Saudi Arabia, featuring a lot of streets without footpaths, discourages most people from walking to work or school [25]. Transforming the urban design of Saudi Arabia to be more activity-friendly needs more effort and time to become safer and more physical activity friendly.

2.4.4 Healthcare

Healthcare providers have regular contact with a substantial proportion of the population, and they frequently interact with patients who have chronic diseases like diabetes or risk factors for cardiovascular disease like hypertension [9]. Evidence shows that healthcare-based interventions targeting physical activity can be effective [78].

The Saudi Ministry of Health has launched several initiatives and programs aimed at teaching and training primary health care providers on physical activity and exercise prescription for patients. In 2015, the Ministry of Health published and implemented the national diet and physical activity strategy to promote healthy lifestyles [79]. They also designed balanced diet and physical activity training manuals, guidelines, and posters, as well as electronic portals and media awareness campaigns. Since 2015, the Ministry of Health has held several lectures, workshops, and training courses for the public about a balanced diet and physical activity in many major cities around the country as part of the National Strategy on Diet and Physical Activity. In 2020, the Ministry of Health launched a health awareness program called Walk 30 across the Kingdom's regions and provinces, aiming to get people to walk at least 30 minutes per day. The ministry intends to promote public health, enhance the walking culture, increase the number of people interested in walking, and assist over 500,000 people with chronic diseases

through this program. Walk 30 is a national program that includes events in schools and universities, a step-counting app, and walking events across the Kingdom on Saudi National Day, March 5, with the theme “Saudi Walks!”. A large part of the Walk 30 campaign was carried out in hospitals and health centres through health practitioners, such as doctors and nurses, under the direct supervision of the Ministry of Health [80].

Additionally, the Ministry of Health has a major role in the new Quality of Life Program, which is one of the programs of the Saudi Vision 2030. According to Crown Prince Mohammed bin Salman, the Saudi Vision 2030 is built around three themes: 1) a vibrant society, 2) a thriving economy and 3) an ambitious nation [81]. The Quality-of-Life Program targets individuals and families by providing the required environment for the development and support of innovative liveability and lifestyle options. It addresses aspects of the environment such as access to green spaces, recreational facilities, and safe public areas, as well as enhancements in cultural, sports, and entertainment infrastructure, all aimed at fostering a healthier, more active population in Saudi Arabia. As the program creates more accessible and inclusive spaces designed to meet diverse lifestyle needs and encourage active engagement it facilitates participation in cultural, entertainment, sports, tourism, and urban activities, as well as other associated activities that improve quality of life. In terms of the Quality-of-Life Program, some policies will be implemented by the MoH, such as prevention programs in public health, including physical activity promotion. In the Quality-of-Life Program, the government is working towards improving the overall health and wellbeing of Saudi citizens and residents. This includes increasing access to healthcare services, enhancing the quality of healthcare facilities and services, and promoting a healthy lifestyle and physical activity by expanding access to parks, sports facilities, and walkable urban spaces [82-83].

2.4.5 Public education including mass media

Health education can be effective in raising awareness towards physical activity [9]. It can include print, audio and electronic media, digital and social media, outdoor billboards and posters, point-of-decision prompts, and mass distribution of information [9]. Mass media are a powerful tool for delivering

consistent and unambiguous messages about physical activity to large groups of people. In recent years, there has been a significant increase in the utilisation of social media in the Kingdom of Saudi Arabia, with a noteworthy 83% penetration rate among users aged 18-35. In Saudi Arabia, with 66.3%, the proportion of the population that are active X users (formerly Twitter) is one of the highest in the world. Saudi Arabian users account for 40% of all tweets in the Middle East and North Africa [84].

In regards to mass and social media, the ministries of health and sport have a leading role in terms of physical activity promotion in the country through their official Twitter accounts. The Saudi Arabia is Walking initiative was a twitter-based campaign from 2017 to 2018. The ministries utilised Twitter as the main platform for raising awareness and encouraging participation in physical activity. The campaign was successful in generating significant engagement among the population, resulting in increased physical activity levels and improved health outcomes for many individuals [76]. Moreover, in 2020 the Ministry of Health launched a health awareness program called Walk 30 across the Kingdom's regions and provinces which is mainly a Twitter-based campaign. Hashtag #Walk30 was created by the MoH, allowing people to participate and share their achievements in walking. Furthermore, the MoH's official account retweeted people's experiences to the followers, reaching more than five million people [85].

2.4.6 Sport and recreation for all

Sport and recreation, particularly sport for development, have been linked to eight of the 17 United Nations' Sustainable Development Goals, with direct linkages to health, social and economic aspects, development and peace [9]. The Saudi Arabian Ministry of Sport has organised a variety of sports events, particularly those aimed at mass participation, such as virtual programs (Move to Game, Step Together 1, and Women's Fitness Festival), and on ground programs (Aseer Waterfront Sports Community Program, Sand Clash CrossFit Competition and Festival, and the Expat Youth Swimming Program) [86]. The virtual programs organised by the Saudi Ministry of Sport are aimed at promoting physical activity and healthy lifestyles, including a balanced diet, among the public. These programs were designed to engage

individuals of all ages and fitness levels through interactive virtual platforms, allowing them to participate in a wide range of fitness and sports activities from the comfort of their own homes.

On the other hand, the on-ground programs organised by the Ministry of Sport were focused on promoting physical activity and sports participation in local communities. These programs provided opportunities for individuals to engage in sports and fitness activities in a fun and social environment, while also promoting the benefits of leading an active lifestyle. Recently, the Ministry of Sport has funded and directed some projects aimed at developing and implementing a Saudi Arabian sports strategy [25]. One of these projects that was established in 2018 by the Ministry of Sport is the Saudi Sports for All (SFA) Federation, a non-profit organisation dedicated to promoting community sports, which has become responsible for promoting physical activity in Saudi society and runs a number of initiatives and programs [87]. Under the Quality-of-Life Program, the SFA was given the responsibility to lead the Ministry of Sport's community sports programs. It also produced a five-year strategy to promote community sports throughout the Kingdom [87]. In terms of the Quality-of-Life Program, some policies will be implemented by the SFA, such as the development and activation of sports facilities which involves organising and promoting activities and events at new facilities to encourage people to use them for physical activity and sports. As well, the SFA is responsible for promoting diversity and female inclusion in sport, redesign and refurbishment of sports facilities to become female and family friendly, establishing new sports federations and build capabilities of elite sports, and the Active People Initiative. This ongoing initiative intends to attract, educate, and encourage people to be regular participants in sports through delivering a variety of virtual and on-ground programs, delivering national community leagues for all ages and in 2021 established the first female football league in the Kingdom [88-89].

2.4.7 Workplaces

The workplace is one potential setting for targeting physically inactive people because most adults spend at least one-third of their weekdays at work. Therefore, ISPAH states that investing in workplace physical activity interventions is a priority as well as a 'strategic business enhancement' opportunity [9]. However,

in Saudi Arabia there are few workplace physical activity programs as the mentality in most organisations is that physical activity during work is considered a waste of time [25]. The Quality-of-Life Program 2020 is working on a new initiative through the Ministry of Sport to activate workplaces by offering mass participation programs such as Workplace Wellness Programs and Fitness Classes. These programs can include a range of activities such as group fitness classes, health education workshops, mental health support, and healthy eating programs. In addition, King Faisal Specialist Hospital and Research Centre (KFSHRC) has recently inaugurated an Employees Wellness Centre, designed to promote the physical, mental, and emotional well-being of its staff. The centre offers a variety of health and wellness services, including fitness programs, mental health support, nutrition counselling, and preventive care initiatives, reflecting the hospital's commitment to fostering a healthy and supportive work environment [90]. The goal of these programs is to improve employee health and well-being, reduce absenteeism and healthcare costs, and increase productivity and job satisfaction [88].

2.4.8 Community-wide programs

Community-wide programs provide more than one approach to addressing physical inactivity in a population because they operate at multiple levels to influence behaviour [9]. In the Saudi Arabian context, some of the initiatives had been discussed in the previous seven physical activity investments. Non-governmental organisations in Saudi Arabia have a vital role in community-wide programs. For example, the Health Promotion Centre (HPC) is one of these organisations which has launched numerous programs and initiatives to promote walking and physical activity. The Health Promotion Centre is an NGO authorised by the Saudi Ministry of Health to work towards promoting community health in Saudi Arabia. The organisation aims to raise awareness about healthy lifestyle habits and to encourage individuals to adopt healthier behaviours. As part of their efforts, the Health Promotion Centre organised walking initiatives in six cities across the Kingdom, including Riyadh, Jeddah, Dammam, Madinah, Tabuk, and Abha. These initiatives were designed to encourage physical activity among community members and promote the benefits of regular exercise. More than 500 retirees participated in these

initiatives, which provided them with an opportunity to engage in physical activity and to socialise with other community members. The organisation also works with other stakeholders in the health sector to develop policies and programs that promote community health and well-being [91].

In conclusion, three ministries of the Saudi Arabian government (Health, Sport and Education) play an active role in the promotion of physical activity in the Saudi community. Several initiatives and projects aiming at promoting physical activity in Saudi Arabia have been identified here. The Ministry of Health plays the biggest role in promoting physical activity in the country due to its central contribution to health promotion. In Saudi Arabia, healthcare settings can provide a unique opportunity for counselling young and old people about physical activity and active living. However, comprehensive research on physical activity counselling practice among physicians in Saudi Arabia's primary health care centres (with almost 50 million annual visits) found that this is an underutilised option for physical activity promotion [92].

Most of the physical activity promoting programs and initiatives in Saudi Arabia are collaborative in nature and involve different stakeholders, such as the Rashaka initiative, which was a collaborative program between the Ministries of Education and Health that was run between 2017 and 2020 and focused on promoting physical activity in schools and increasing awareness about the importance of leading an active lifestyle. Both locally and internationally, the proportion of physical education lesson time that children engage in moderate to vigorous physical activity has been shown to be less than optimal for health enhancement [68]. Consequently, more initiatives and programs are needed to integrate physical activity policies into the education system. Moreover, the Ministry of Sport also has some collaborations with different stakeholders. For example, it recently signed a collaborative agreement that addresses several strategic areas with the World Health Organization and the Ministry of Municipal and Rural Affairs [89]. Nevertheless, the vast majority of physical activity programs and initiatives in Saudi Arabia lack rigorous outcome evaluations. For instance, a recent systematic review of obesity interventions for adults in the Gulf countries found that the majority of the identified studies did not have control groups [93].

Currently, from my point of view, whole-of-school programs, healthcare, and sport would be the best investments that work for physical activity in Saudi Arabia until public transport and urban design have improved sufficiently to become potential contributors to population levels of physical activity. Ensuring appropriate policies, services and support for physical activity promotion should prioritise the best three investments and the others in the future. Identifying the three best investments for Saudi Arabia has significant implications. It provides a focused approach for allocating resources and designing interventions that are contextually relevant and immediately impactful. By concentrating efforts on these areas, policymakers and stakeholders can address the most pressing barriers to physical activity while laying the groundwork for integrating additional investments, such as active transport and urban design, as infrastructure and societal conditions evolve. This strategic prioritisation ensures the efficient use of resources and maximises the potential for achieving tangible health outcomes in the short and long term.

2.5 Barriers to physical activity

The first step in establishing comprehensive and culturally relevant ways to promote physical activity and help resolve related health inequalities in any population is to identify and critically examine barriers to and facilitators for physical activity [92]. Based on evidence from systematic reviews, Bauman et al. (2012) provided a summary of correlates and determinants of physical activity in children, adolescents and adults [8]. In line with the socio-ecological model of health [22], physical activity behaviour is determined by multiple levels of influence, including individual factors (e.g. age, gender, attitudes, beliefs), interpersonal factors (e.g. social support, social norms), environmental factors (e.g. access to recreational facilities, neighbourhood safety), and policy factors (e.g. laws and regulations). These factors are interconnected and interact with each other in their impact on physical activity behaviour. The ecological model suggests that interventions aimed at increasing physical activity should address factors at multiple levels of influence in order to be effective [8, 22].

In Saudi Arabia, studies on barriers to physical activity have been conducted in different regions and populations. Al-Otaibi stated that the main barrier for Saudi females was a lack of time, while for males it

was a lack of motivation. However, in comparison to males, females had fewer internal barriers. Additionally, the hot climate is a significant barrier to physical activity in Saudi Arabia [43-44].

2.6 Gaps in the literature

Through the extensive literature review for this doctoral thesis understudied areas were identified, particularly physical activity policies in GCC countries and barriers for physical activity in the southern region of Saudi Arabia which despite of its much cooler climate has a *higher* prevalence of insufficient physical activity (85%) and obesity (27.6%) compared to the rest of the country (82.6%, respectively 24.7%) [16-17, 44, 94].

Pogrmilovic and colleagues conducted a systematic scoping review to examine the academic literature on national-level physical activity policies in 168 countries [95-96]. However, while polices in GCC countries were also covered, their review for the Gulf states was largely just based on a report by the World Health Organization from 2014 [97]. For this doctoral thesis, physical activity policies in the GCC countries were analysed in depth. The perspectives of policymakers from various ministries toward these policies were also explored.

Some studies have been published about barriers to physical activity in different regions of Saudi Arabia [98-100]. However, only one such study was about the southern region of Saudi Arabia and it was limited to medical students as a specific subgroup of the population [101]. As well, no qualitative studies that examine the opinions and perspectives about facilitators for and barriers to physical activity of the general population in Saudi Arabia, and the southern region specifically, have been published. The southern region of Saudi Arabia, with a population of six million people, has a unique and different culture from the rest of the Kingdom and has a distinct geographic and mountainous terrain [102]. Understanding why individuals in the southern region of Saudi Arabia exhibit lower levels of physical activity despite the cooler climate and more favourable natural environment warrants investigation for this thesis. Therefore, in the third study of this PhD, a qualitative study was conducted to explore how people in the southern region of Saudi Arabia conceptualise physical activity (PA) and the reasoning used

in their decision-making related to PA (Figure 3). Examining barriers for the successful implementation of physical activity policy at the local level in the southern region is crucial to understanding the implementation process. In this thesis, barriers to physical activity in the southern region of Saudi Arabia were identified to inform future improvements in the promotion of physical activity, including through policy development. Given the limited research on physical activity policies in the Gulf region, policies in the GCC countries, including Saudi Arabia, were first analysed (Papers 1 and 2) and subsequently linked to the identified barriers in the southern region of Saudi Arabia. The existing body of literature revealed notable gaps in our understanding of the comprehensive landscape of physical activity policies within the Gulf countries, particularly in relation to the specific barriers and facilitators identified in the southern region of Saudi Arabia. Addressing these gaps required an exploration of the contents and approaches embedded in national physical activity policies across GCC countries. A critical examination of the alignment between these policies and the cultural, social, and environmental factors influencing physical activity in the southern region of Saudi Arabia was crucial for a comprehensive understanding. By delving into these inquiries, gaps in the literature were addressed, and attention was drawn to the nuanced intersections between policy frameworks and local influences on physical activity in the Gulf region.



Figure 3: Regions of Saudi Arabia

CHAPTER

3

3 RESEARCH METHODS

3.1 Overview

This chapter provides an overview of the research methods employed in this doctoral thesis, which is divided into three studies, each addressing one of the research objectives. The first study, detailed in Chapter 4, is qualitative research on physical activity policies in Saudi Arabia and Oman. The second study, discussed in Chapter 5, focuses on an analysis of physical activity policy documents across Gulf countries. The third study, presented in Chapter 6, examines how the people in the southern region of Saudi Arabia conceptualise physical activity (PA) and the reasoning they use to make decisions related to PA.

3.2 Research studies: Design and methodology

Building on the Social Ecological Model [22] discussed in Chapter 2, the methodology of this thesis was structured into three distinct studies, each designed to address specific research objectives and answer the corresponding research questions through qualitative methods. Table 2 provides a detailed illustration of the three studies of this thesis, outlining the specific objectives, the qualitative approaches employed for each, and the corresponding levels of the socioecological model addressed.

3.2.1 Research paradigm and epistemological framework

The three studies in this thesis were underpinned by an interpretivist paradigm, which aligns with the aim of understanding the complexities of human experiences, behaviours, and social phenomena within their specific contexts [103]. An interpretivist approach was particularly suited to these studies, as it facilitated an in-depth exploration of physical activity policies and the nuanced ways in which individuals and stakeholders in the Gulf Cooperation Council countries perceive and interact with these policies. This paradigm emphasises the co-construction of meaning between researchers and participants, allowing the studies to capture the rich, subjective experiences of individuals in Saudi Arabia and Oman through semi-structured interviews, the contextual and cultural implications of policy documents across the GCC, and

the personal accounts of PA experiences in the southern region of Saudi Arabia. Additionally, the Socio-Ecological Model (SEM) [22] was employed to provide a comprehensive framework that considers multiple levels of influence on physical activity, ranging from individual behaviours to broader social, environmental, and policy factors. This model enabled a deeper understanding of how interconnected influences shape physical activity engagement and informed the analysis of policies within their broader cultural and systemic contexts.

Table 2: Studies, objectives, approaches, and integration with the social-ecological model (SEM) of the thesis

Study	Objective	Approach	SEM level
1	To understand the mechanisms which underpin policy development and implementation in Saudi Arabia and Oman.	Qualitative study using semi-structured interviews to identify perspectives and opinions of stakeholders regarding physical activity policies and their implementation in Saudi Arabia and Oman.	Policy level: Focuses on how policies are developed and implemented at a systemic level.
2	To define/describe the physical activity policy document environment and assess the quality and application of those policies in the GCC.	Qualitative study based on the approach by Gelius et al. (2021) and the HEPA PAT for physical activity policy monitoring was employed to conduct a comparative analysis of PA policies across all GCC countries.	Policy and organisational levels: Examines the structure and quality of policy documents and their alignment with institutions.
3	To understand how individuals account for their experiences with physical activity in the southern region of Saudi Arabia. Document how government efforts to promote PA are viewed by residents in the Southern Region.	Qualitative semi-structured interviews with the adult population from the southern region.	Policy, community, institutional, interpersonal and individual levels: Examine the physical environment, organisations (e.g., gym, work) culture, as well as interpersonal relations.

3.2.2 Study 1: Qualitative study with semi-structured interviews in Saudi Arabia and Oman

Study design

In the context of this study, the policy level within the socioecological model [22] provides a valuable perspective for examining how systemic-level policies influence physical activity behaviours. This is a qualitative study using the interpretivist research paradigm [104], comprising semi-structured interviews with key stakeholders in physical activity policy-making in Saudi Arabia and Oman. We utilised the Consolidated criteria for reporting qualitative research (COREQ) checklist to ensure the rigour and transparency of our qualitative methods [105].

Sampling and recruitment

We defined stakeholders as those that are directly involved in the development, implementation and evaluation of physical activity policies. We initially sought to conduct interviews with stakeholders in all six GCC countries. We attempted to reach stakeholders in the Ministry of Health (MoH) in each GCC country by writing to the official email address of the ministries to introduce the study and request the contact details of relevant stakeholders. Despite following up with non-responders, we did not receive any replies from Qatar, Bahrain, Kuwait and the United Arab Emirates. Therefore, we narrowed the scope to Saudi Arabia and Oman, the two largest countries of the six, with 36.4 million and 4.6 million inhabitants, respectively, accounting for 70% of the GCC's population [106]. After obtaining contact details of key stakeholders from the ministries, the participants were contacted directly via email or telephone. To recruit additional participants, we used snowball sampling by asking interviewees to provide contact details of other relevant stakeholders in their organisation. Because of the documented previous involvement of the sports and education sectors in promoting physical activity in the Gulf States [97], we also asked participants to identify relevant stakeholders in the Ministries of Sports and Education in Saudi Arabia and Oman. Our study focused on the Ministries of Health, Sports, and Education as they are significantly involved in promoting physical activity within Gulf Cooperation

Council countries [25, 107]. Attempts to contact the ministers directly were unsuccessful. However, we managed to reach senior staff in the ministries and in university sports federations which belong to the Ministries of Education. Additionally, we employed different strategies to engage participants from the non-governmental sector in both countries, including networking through professional contacts of the first author, utilising online platforms, such as Twitter and Facebook, and forums and capitalising on established partnerships with both non-governmental organisations (NGOs) and governmental sectors.

Procedure

Participants were provided with information on the study, and all gave written consent to take part in the study. Additionally, participants were informed at the beginning of the interview that they could withdraw from the study at any time if they chose not to continue participating. An interview guide (Appendix 9), based on a review of previous literature [25, 108], and collaborative input from the authors, was developed. In the interviews, we explored stakeholders' perspectives and opinions regarding existing physical activity policy documents from the Ministries of Health, Education and Sport in their country, as well as facilitators and barriers to physical activity policy development, implementation and evaluation, with field notes made during the interviews. I conducted the interviews via Zoom between December 2021 and February 2022. Interviews were conducted in Arabic, were audio-recorded with permission obtained from the participants and transcribed verbatim, and lasted between 10 min and 45 min. Repeat interviews were not carried out. The following personal information was collected from each participant: name, organisation, position, age, gender and previous work experience. The participants were provided with an opportunity to review the Arabic transcripts for accuracy, and the final transcripts were translated into English. Monitoring of data saturation, an ongoing process based on the notion of informational redundancy [109], was conducted to ensure that comprehensive insights were obtained. The determination of the number of participants needed to reach data saturation was done separately in each country.

Data analysis

I, Adrian Bauman and Peter Gelius reviewed the transcripts to familiarise themselves with the content, after which thematic analysis was jointly undertaken by all three authors to code each transcript. Themes were subsequently developed through a partially deductive approach: Main categories were derived from the HARDWIRED framework [110] (covering aspects such as development process, partnerships, resources, communication, evaluation and evidence-base) and CAPPA criteria [111] (including sectors/institutions involved, implementation, legal status, target groups, goals and targets, timeframe, budget and evaluation/surveillance). Subsequently, sub-categories were added via an inductive process conducted by me during the thematic exploration stage, involving a comprehensive review of all codes within the combined dataset encompassing both Saudi Arabia and Oman. I, AB and PG discussed the coding and the preliminary interpretations to cross-validate the findings. Interpretation of themes was informed by a comprehensive analysis of the extant literature and relevant findings from previous studies [25, 108]. As a medical doctor at King Faisal Medical City in the southern region of Saudi Arabia, my professional background informed his approach to data analysis in this qualitative study. The findings from this study, which are detailed in chapter 4, were published in the journal *Health Research Policy and Systems* [112]. The study highlights key areas where policies were successful and areas needing improvement, forming the foundation for subsequent studies of this doctoral research.

3.2.3 Study 2: Analysis of physical activity policy documents in GCC countries

The second study involved a comprehensive analysis of physical activity policy documents from all six GCC countries. This study aimed to explore the overall landscape of physical activity policies and assess their alignment with the opinions and perspectives of people in the southern region of Saudi Arabia. Using the policy and organisational levels of the socioecological model (SEM) [22], we examined the structure and quality of these policy documents and evaluated their alignment with institutional frameworks and practices, providing a deeper understanding of their applicability and effectiveness.

Document retrieval

A systematic online search for documents containing physical activity policies was undertaken on the websites of the Ministries of Health, Education, Sport, Transport, Tourism, Municipal and Rural Affairs, Recreation and Leisure, Environment, Work and Employment, and Finance for all six GCC countries between March 2023 and February 2024. The search process followed a structured and predefined strategy, including the use of specific keywords such as “physical activity,” “exercise,” “sports policy,” “health promotion,” “active lifestyle,” “movement guidelines,” “public health strategy,” and “national health initiatives.” These keywords were consistently applied across all ministry websites to ensure comprehensive coverage. These ministries were selected as they have been shown to have portfolios relevant to physical activity [112]. We included documents that contained any policy aimed at promoting physical activity and that were published in Arabic or English. As mentioned previously, for study 1 [112], we consulted physical activity experts from the Ministries of Health, Education and Sport in Saudi Arabia, Oman, and Bahrain to identify other relevant unpublished documents. We made multiple attempts to contact stakeholders from these Ministries in the United Arab Emirates, Qatar, and Kuwait; however, we did not receive any response. AA was responsible for conducting the document search and for translating content from Arabic to English. Notably, this study analyses publicly accessible documents from government websites across all Gulf countries and, therefore, did not require ethical approval.

Document analysis

The aim of our analysis was to understand how physical activity policies are developed, implemented, and evaluated, thus contributing to knowledge by identifying strengths, gaps, and opportunities in existing policies, and thereby informing future policy development and public health strategies. Ali Alzahrani analysed the policy documents under the guidance of Peter Gelius, Adrian Bauman, and Anne Grunseit, who have expertise in physical activity policies and qualitative research. We applied elements of the Health-Enhancing Physical Activity Policy Audit Tool (HEPA-PAT) [20] to examine relevant

policies in the GCC countries. The HEPA-PAT offers a thorough framework for assessing the breadth, details, and execution of physical activity policies, making it particularly suitable for comparing policy landscapes across different regions. Following Gelius et al., who in their 2021 study analysed physical activity policies in four countries in Europe, we divided the questions from the HEPA-PAT into three groups. I: Data available via existing national government surveys; II: Data retrievable via desk research; III: Expert opinion [18]. Due to the limited responsiveness of policymakers in some of the Gulf countries, notably in the UAE, Qatar, and Kuwait, we could not apply all components of the HEPA Policy Audit Tool. Therefore, we used the PAT questions which may be answered through desk research (data groups I and II). For standardisation, we focused on national level documents, as these reflect the centralised policy directions that significantly impact regional outcomes.

In line with Gelius et al. (2021) [18], the PAT questions were allocated across the six categories of the policy cycle model, which we used as a framework for the analytical themes in the documentary analysis [113]. This model categorises the policy-making process into six stages: policy-making structures; agenda-setting; policy formulation; decision-making; policy implementation; and evaluation (Table 1). The policy cycle model assumes that the stages will be repeated as policies are improved and adapted to different contexts [113]. The main advantage in analysing physical activity policies using this model is that it divides the policy-making process into different phases, assisting policy-makers to think systematically about the process, identify key stakeholders, and pinpoint critical moments for intervention and evaluation [18]. We employed content analysis to systematically examine and interpret physical activity policy documents in the GCC countries [18, 114]. This approach allowed us to identify key themes and insights, while the constructivist paradigm provided a framework for understanding the socio-political contexts and subjective meanings embedded within these policies. To enhance the trustworthiness and credibility of the data analysis, we maintained an audit trail to document the research process and decisions made throughout the analysis. We utilised the Standards for Reporting Qualitative Research (SRQR) checklist to ensure the rigor and transparency of our qualitative methods [115]. The documents analysed included national policy statements, strategic plans, and implementation guidelines.

This study identified the strengths and weaknesses of existing policies, revealing gaps in addressing the specific needs of different regions (see Chapter 5).

3.2.4 Study 3: Understanding physical activity in the southern region of Saudi Arabia

The third study of this doctoral thesis is focused on exploring how the people in the southern region of Saudi Arabia conceptualise physical activity (PA) and the reasoning they use to make decisions related to PA. This study addresses all levels of the Socio-Ecological Model (SEM), including policy, community, institutional, interpersonal, and individual levels. It examines the physical environment, organizations, cultural influences, and interpersonal relationships that shape physical activity behaviors. Chapter 6 provides a detailed examination of these findings.

Study design

We conducted a qualitative study using semi-structured interviews with adults in the southern region of Saudi Arabia from February to May 2024.

Site selection

Recruitment took place through primary healthcare centres. In southern Saudi Arabia, there are 600 primary healthcare centres, of which 50 are designated as on-duty centres that operate for extended hours compared to regular centres. These on-duty centres are strategically distributed across four subregions, covering both urban and rural areas to ensure comprehensive healthcare access and address varying socioeconomic needs [116]. We specifically targeted these on-duty centres because they serve a diverse cross-section of the community and accommodate a high number of patients. The centres varied in operating hours (double shifts or 24 hours), location (urban vs rural), and area-level socioeconomic status (low, medium, high). All on-duty healthcare centres in the Southern region were included in the population to ensure a spread of locations in the sample. We approached GPs directly at the primary health care centres to facilitate data collection.

Participant recruitment and consent

Participants were recruited through General Practitioners (GPs), as people generally trust GPs [117], increasing the likelihood of finding potential interviewees. The email addresses and contact numbers of GPs in the on-duty healthcare centres were obtained through the Health Affairs in the southern region. We emailed electronic flyers with an information sheet to GPs in all 50 on-duty healthcare centres through the Administration of Scientific Research in Health Affairs in the southern region (Appendix 10). The flyers covered study objectives and requirements and the researcher's contact details. GPs who did not respond within one week were contacted again and were given another week to reply. If there was still no response, the lead researcher made contact via mobile phone (number obtained through Health Affairs in the southern region). Once a GP agreed to be part of the study, they recruited patients attending their clinics over an 8-week period by verbally explaining the study and its objectives to each patient individually, depending on their interest in participation. If patients agreed to participate, their GP notified the primary researcher, who subsequently contacted the patients directly and sent an information and consent form via email. Participants could nominate their preferred interview times. At the beginning of the interview, participants were informed that they could withdraw from the study at any time and their participation was entirely voluntary. Individuals' right to decline participation was respected, and participants were not pressured in any way to take part; however, no participant declined to complete the study after they filled out the consent form.

Inclusion and exclusion criteria

The study included adults aged 18 years and older who had resided in the region for at least one year to ensure familiarity with the area. Individuals with pre-existing health conditions or circumstances that might significantly impact their ability to engage in physical activity were excluded. The final decision to select suitable participants was made by the GPs who were informed of the exclusion criteria. The recruitment process relied entirely on the GPs and the participants' willingness to take part in the study.

However, there was no definitive method to independently verify this process. All 15 participants who expressed interest were included in the study, and no participants were excluded.

Participant sampling

Sampling was purposive, using a maximum variation approach to ensure a diverse range of participants for the interviews. Specifically, sampling aimed to include men and women, individuals from high, middle, and low-income backgrounds, residents from both urban and rural settings, younger adults (18-25), middle-aged adults (26-45), older adults (46+), and individuals with various educational backgrounds (primary, middle or high school, Bachelor's degree, or higher education). Previous research has shown that people's capacity to access and engage in physical activity can vary based on these attributes [8, 118]. The final sample size was determined by data saturation, which is the point at which no new information emerged during the interviews [119]. After reaching this point, recruitment ceased [120].

Data collection and management

Semi-structured one-on-one interviews were conducted in Arabic via video conference (Zoom) with fifteen participants by the lead author who is a native Arabic speaker. The interview guide (Appendix 1) was informed by the social-ecological model [22] and literature that explored factors hindering or promoting physical activity through qualitative studies [8, 121-122]. The discussion guide probed social, cultural, and environmental dimensions, to get a broad spread of factors which might interact and influence physical activity levels and choices among the local population. The interviews were audio-recorded using a Zoom account, and no repeat interviews were necessary, as all required data were obtained during the initial sessions. Audio recordings were transcribed verbatim to English by Sonix (an online program for transcribing and translating recordings from Arabic to English) and checked for accuracy by the principal author [123]. Participants were offered the opportunity to check their transcripts but none availed themselves of this. Data were anonymised and a unique non-identifying code was

applied to each transcript which were then imported into qualitative data analysis software (NVivo version 14.0) [124]. Identifying comments (names or locations) were disguised to preserve anonymity.

Data analysis

The analysis was conducted by the principal author, a medical doctor at King Faisal Medical City in the southern region, under the guidance of his three supervisors. The principal author had conducted interviews and qualitative analysis for a previous study [112] and is interested in physical activity and the prevention of chronic diseases. Two supervisors have extensive experience in qualitative and mixed-method research in chronic disease prevention, including in physical activity, while the other has expertise in physical activity research and epidemiology.

Inductive thematic analysis was used, characterised as a technique for identifying, analysing, and elucidating patterns and themes within the collected data without preconceived ideas or theories [125]. We followed the analytic phases outlined by Clarke and colleagues [126]. Specially, after transcribing the interviews, the principal author familiarised himself with the data by carefully reading the transcripts. Next, codes were generated inductively, identifying meaning in relation to the overarching research aims, and applied to a small number of transcripts (n=4). The codes and coding were reviewed by one supervisor to clarify content and interpretation. The principal author modified the coding frame to incorporate new or adjusted content and applied them across the dataset, with iterative consultation with the supervisors on codes and their application and interpretation. Candidate themes were generated iteratively through the retrieval of code content across the dataset and consultation with the supervisors. Themes were revised and defined to eliminate overlapping or weak themes. The final themes were selected by the research team for their adequacy in explaining the interviewees' accounts of their physical activity within their geographic location.

The completion of these three studies provided a comprehensive understanding of physical activity policies and their implementation in the GCC countries, with a particular focus on the southern region of

Saudi Arabia. The findings, which are discussed in Chapters 4, 5, and 6, contribute valuable insights into how policies can be tailored to better meet the needs of diverse populations within the region.

3.3 Researcher reflexivity

Researcher reflexivity is a critical component of qualitative research, particularly within an interpretivist paradigm. Throughout the research process, the researcher's positionality, biases, and assumptions can influence data collection, analysis, and interpretation [127]. As the principal investigator, I documented my reflections on how my background, experiences, and perspectives may have shaped interactions with participants and the interpretation of findings. For instance, as a researcher with a vested interest in promoting physical activity, I was conscious of ensuring that participants' voices and experiences were authentically represented, rather than being overshadowed by preconceived notions. Moreover, being a native Arab provided me with valuable personal insights into the cultural context and nuanced cultural references that might otherwise be overlooked or misunderstood by an outsider, allowing for a deeper and more culturally informed interpretation of the findings.

Engaging in regular discussions with my supervisors provided an additional layer of critical reflection, helping to identify potential biases and enhance the credibility of the research. Furthermore, I deliberately adopted strategies such as setting aside preconceptions during the data collection and analysis phases. By revisiting and challenging my interpretations iteratively, I aimed to avoid imposing my own beliefs on the data.

CHAPTER

4

4 STUDY 1

Physical activity policies in Saudi Arabia and Oman: A qualitative study using stakeholder interviews

4.1 Overview

This chapter, representing study 1 of this thesis, is a paper exploring the development and implementation of physical activity policies in Saudi Arabia and Oman, two of the largest Gulf Cooperation Council (GCC) countries. The paper presents a qualitative analysis based on semi-structured interviews with senior policymakers from key ministries, including Health, Education, and Sports. It provides an in-depth understanding of the systemic factors influencing policy processes, highlighting barriers and facilitators in cross-sectoral collaboration, leadership, and resource allocation [112].

4.2 Study 1: ‘Physical activity policies in Saudi Arabia and Oman: A qualitative study using stakeholder interviews’

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Physical activity policies in Saudi Arabia and Oman: a qualitative study using stakeholder interviews



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Abstract

Background Countries in the Middle East have some of the lowest rates of physical activity and some of the highest rates of obesity in the world. Policies can influence population levels of physical activity. However, there is a dearth of research on physical activity policies in the Gulf region. This qualitative study analyses cross-sectoral barriers and facilitators for the development, implementation and evaluation of physical activity policies in Saudi Arabia and Oman, two of the largest countries in the region.

Methods Semi-structured interviews were conducted with 19 senior policymakers from the Ministries of Health, Education, and Sport in Saudi Arabia and Oman, and were examined using thematic analysis.

Results We identified seven themes related to physical activity policies in Saudi Arabia and Oman: leadership; existing policies; physical activity programs related to policies; private sector policies; challenges; data/monitoring; and future opportunities. Both countries have a central document that guides policy-makers in promoting physical activity, and the available policies in both countries are implemented via multiple programs and initiatives to increase physical activity. Compared with Oman, in Saudi Arabia, programs from the non-profit sector, represented by community groups, play a more significant role in promoting physical activity outside the government framework. The private sector has contributed to promoting physical activity in both countries, but interviewees stated that more financial support is required. Policy limitations differ between Saudi Arabia and Oman: intersectoral collaboration in Oman is limited and mainly based on individuals' own initiative, while the health transformation in Saudi Arabia tends to slow down policy implementation in relevant areas. Physical education in Saudi Arabia and Oman is similar; however, increased support and collaboration between government agencies and the private sector for out-of-school sports academies are needed.

Conclusions This study addresses key gaps in analysing physical activity policies in Gulf Cooperation Council countries. Our study highlights the importance of increasing financial support, improving collaboration between governmental agencies and between them and the private sector and consolidating efforts to back physical activity policies and dismantle cross-sectoral barriers in Saudi Arabia and Oman. Educational institutions in Saudi Arabia and Oman play a crucial role in promoting physical activity from early childhood to young adults. Our insights assist policy-makers, public health officials and stakeholders in shaping effective physical activity-promoting policies, programs and interventions to prevent non-communicable diseases. Challenges identified in Saudi Arabia and Oman's policies will inform their future development.

Keywords Physical activity, Health policy, Saudi Arabia, Oman, Gulf region

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Background

Despite the health benefits of physical activity [1–3], in most countries, large proportions of the population remain insufficiently active [4, 5]. In line with social-ecological models of health [6], the need for policies to increase population levels of physical activity has been highlighted [7, 8]. Physical activity policy is defined as any formal or informal legislative or regulatory action or organized guidance provided by governments and organizations [9–12]. Policies can be cross-sectoral and encompass access to various forms of physical activity, including walking and cycling, regulate and promote programs and initiatives, and provide a comprehensive framework for the design, funding and implementation of diverse physical activity interventions [9, 13, 14].

Countries in the Middle East have amongst the lowest levels of physical activity and some of the highest rates of overweight and obesity in the world [4, 15]. In Saudi Arabia and Oman, only 29.7% and 25.6% of the adult population, respectively, meet the physical activity recommendations. For the Middle East and North Africa (MENA) region the rate is 38.5% and the global average is 31.3% [4]. Moreover, in 2020 in Oman, Qatar, Bahrain, Kuwait and the United Arab Emirates, more than 80% of teenagers and 55% of adults (45% of men and 65% of women) were not sufficiently active [16]. In Saudi Arabia and Oman, dietary patterns are shifting due to increased consumption of processed foods, leading to higher rates of obesity, diabetes and cardiovascular diseases. Traditional diets rich in fruits, vegetables and lean meats are being replaced by fast food and sugary drinks. Moreover, reduced physical activity and increasingly sedentary lifestyles are major determinants of the obesity epidemic [17, 18]. Therefore, there is an urgent need in this region for action on physical activity, including policy development, implementation and evaluation.

The 2014 report from the WHO Regional Office for the Eastern Mediterranean on promoting physical activity in the region included a policy mapping exercise on national policy and action on physical activity in all 22 member states [19]. National physical activity policies were reported for most countries, including all members of the Gulf Cooperation Council (GCC), a political and economic alliance of six Middle Eastern countries [Saudi Arabia, Kuwait, the United Arab Emirates (UAE), Qatar, Bahrain and Oman] that share a similar cultural, social and economic background. According to WHO's recent *Global Status Report on Physical Activity* [16], only 11 of the 22 countries in the Eastern Mediterranean Region had a national physical activity strategy, while all GCC countries had one. The report also identified some partnerships to promote physical activity between

various ministries in the Gulf states, particularly across the health, sports and education sectors.

In a systematic scoping review, Klepac Pogrmilovic et al. examined the academic literature on physical activity policy and identified 163 papers, covering 168 countries, including all 6 GCC members [20]. Few papers on physical activity policy across the Eastern Mediterranean region were identified, thus, the findings for the region were largely based on the 2014 report of the WHO Regional Office [20]. In another study by Klepac Pogrmilovic and colleagues, a survey on national physical activity policies was completed by representatives of 76 countries. However, this only included three of the 22 countries from the Eastern Mediterranean Region. The authors also emphasized that although national policies and strategies exist in all GCC countries, implementation is lacking. The authors recommended that further research be undertaken into physical activity and sedentary behaviour policy in the region [8]. It is essential to contextualize these findings with regard to physical activity policies in the Gulf region, including disparities and challenges in their implementation.

Recently, Albululaya et al. analysed physical activity policy initiatives in Saudi Arabia by conducting semi-structured interviews with three policy-makers from the Ministries of Education and Sports and with six Saudi academics working in this field [21]. Surprisingly, they did not interview anyone from the Ministry of Health. They concluded that while physical activity amongst Saudis overall has increased, levels among women are still low. While Albululaya et al. analysed aspects of physical activity policy development, implementation and evaluation in Saudi Arabia, they did not address potential cross-sectoral barriers and facilitators for these processes.

The primary objective of the present study was to analyse cross-sectoral barriers and facilitators for physical activity policy development, implementation and evaluation in GCC countries. The best research paradigm for this study is qualitative research. We chose interpretivist research to describe complex social realities, explore new or under-researched subjects and generate hypotheses for future quantitative research. This approach allows for a detailed examination of phenomena, which is difficult with quantitative methods. Practically, we also lacked a large, easily accessible sample to survey quantitatively. Therefore, interpretivism is particularly effective for understanding stakeholder perspectives on physical activity policies in unique cultural settings, such as those in Saudi Arabia and Oman, providing deep insights into subjective experiences and nuanced views. To achieve this, we interviewed policy-makers from the Ministries of Health, Sport and Education in Saudi Arabia and Oman,

the two largest countries in the GCC. We picked these three ministries as previous research highlights that they are chiefly responsible for promoting physical activity and implementing related policies in the Gulf region [22–24].

Methods

Study design

This is a qualitative study using the interpretivist research paradigm [25], comprising semi-structured interviews with key stakeholders in physical activity policy-making in Saudi Arabia and Oman. We utilized the COREQ checklist to ensure the rigour and transparency of our qualitative methods (Appendix 1).

Sampling and recruitment

We defined stakeholders as those that are directly involved in the development, implementation and evaluation of physical activity policies. We initially sought to conduct interviews with stakeholders in all six GCC countries. We attempted to reach a contact in the Ministry of Health (MoH) in each GCC country by writing to the official email address of the ministries to introduce the study and request the contact details of relevant stakeholders. Despite following up with non-responders, we did not receive any replies from Qatar, Bahrain, Kuwait and the United Arab Emirates. Therefore, we narrowed the scope to Saudi Arabia and Oman, the two largest countries of the six, with 36.4 million and 4.6 million inhabitants, respectively, accounting for 70% of the GCC's population [26]. After obtaining contact details of key stakeholders from the ministries, the participants were contacted directly via email or telephone. To recruit additional participants, we used snowball sampling by asking interviewees to provide contact details of other relevant stakeholders in their organization. Because of the documented previous involvement of the sports and education sectors in promoting physical activity in the Gulf States [19], we also asked participants to identify relevant stakeholders in the Ministries of Sports and Education in Saudi Arabia and Oman. Our study focussed on the Ministries of Sports, Health and Education as they are significantly involved in promoting physical activity within Gulf Cooperation Council countries [22–24]. Attempts to contact the ministers directly were unsuccessful. However, we managed to reach senior staff in the ministries and in university sports federations which belong to the Ministries of Education. Additionally, we employed different strategies to engage participants from the non-governmental sector in both countries, including networking through professional contacts of the first author, utilizing online platforms such as Twitter and Facebook and forums and capitalizing on established

partnerships with both non-governmental organizations (NGOs) and governmental sectors.

Procedure

Participants were provided with information on the study, and all gave written consent to participate. Additionally, participants were informed at the beginning of the interview that they could withdraw from the study at any time if they chose not to continue participating. An interview guide, based on a review of previous literature [22, 24] and collaborative input from the authors, was developed (Appendix 2). In the interviews, we explored stakeholders' perspectives and opinions regarding existing physical activity policy documents from the Ministries of Health, Education and Sport in their country, as well as facilitators and barriers to physical activity policy development, implementation and evaluation, with field notes made during the interviews. A.A. conducted the interviews via Zoom due to the coronavirus disease 2019 (COVID-19) pandemic between December 2021 and February 2022. Interviews were conducted in Arabic, were audio-recorded with permission obtained from the participants and transcribed verbatim, and lasted between 10 min and 45 min. Repeat interviews were not carried out. The following personal information was collected from each participant: name, organization, position, age, gender and previous work experience. The participants were provided with an opportunity to review the Arabic transcripts for accuracy, and the final transcripts were translated to English. Monitoring of data saturation, an ongoing process based on the notion of informational redundancy [27], was conducted to ensure that comprehensive insights were obtained. The determination of the number of samples needed to reach data saturation was done separately in each country.

Data analysis

Authors A.A., A.B. and P.G. reviewed the transcripts to familiarize themselves with the content, after which thematic analysis was jointly undertaken by A.A., A.B. and P.G. to code each transcript. Themes were subsequently developed through a partially deductive approach: Main categories in Table 1 were derived from existing frameworks of the policy process, such as the HARDWIRED framework [28] (covering aspects such as development process, partnerships, resources, communication, evaluation and evidence-base) and CAPPA criteria [29] (including sectors/institutions involved, implementation, legal status, target groups, goals and targets, timeframe, budget and evaluation/surveillance). Subsequently, sub-categories were added via an inductive process conducted by A.A. during the thematic exploration stage, involving a comprehensive review of all codes within the

Table 1 Main themes and subthemes from interviews with physical activity policy-makers from Saudi Arabia and Oman

Main themes	Sub-themes Saudi Arabia	Sub-themes Oman
<p>Leadership: development of and advocacy for policies that promote PA, including assistance and resources for stakeholders to facilitate the integration of PA into daily life</p> <p>Existing policy documents: most relevant existing policy documents identified by policy-makers to be analysed in a follow-up study</p> <p>Implementation of PA policies: (A) PA programs related to policies (implementation programs) – Kinds of PA programs and strategies reported (B) Role of the private sector in PA</p> <p>Data/monitoring for PA policies: importance of data and monitoring for PA policy development, implementation and evaluation</p> <p>Challenges: potential difficulties faced in implementation of PA policies and related programs</p>	<p>Collaboration between Health and Sport Ministries for nationwide physical activity policies</p> <ul style="list-style-type: none"> • Health in All Policies (HiAP) as a key objective in Vision 2030 • Intersectoral collaboration in health • Quality of life document [31] • Exploratory examination document [41] • University sports federation strategy document [33] • Healthy food/PA strategy documents [34–36] <p>Initiatives to boost physical activity: Walk 30 Minutes by MoH and Talented Support Program by MoS Promoting physical activity in malls and universities: Healthy Mall Campaign and Healthy Campus Project by the Ministries of Health and Education</p> <ul style="list-style-type: none"> • National Strategy for Healthy Food and Physical Activity (2015–2025) initiatives • Corporate support for physical activity programs: Tatweer educational company and Red Sea company's contributions to schools and communities • Private universities' promotion of PA for staff and students • NGO and community group initiatives for walking and hiking programs <p>Lack of good data on PA prevalence across ministries</p> <ul style="list-style-type: none"> • Inconsistent data and comparison challenges in physical activity levels across populations and regions <p>Economic challenges</p> <ul style="list-style-type: none"> • Lack of funding for research • Lack of funding for facilities • Sustainability of physical activity programs <p>Political challenges</p> <ul style="list-style-type: none"> • Lack of collaboration between the ministries • Health sector transformation as part of Vision 2030 <p>Environmental challenges</p> <ul style="list-style-type: none"> • Hot climate • Negative attitudes in the community towards physical activity 	<ul style="list-style-type: none"> • Ministry of Health's role and committees for NCD prevention and control • HiAP achievements rely on individual agency initiatives • Limited inter-ministerial cooperation • Oman's Vision 2040 document • Education documents (e.g. student learning calendar, education document, education standards document and the school sports curriculum) • Oman's Sports Strategy document • National Policy for Prevention and Control of NCDs document* • Oman's Ministry of Education's strategies to promote physical activity in schools • Community-based physical activity initiatives during COVID-19: Active community and Healthy cities and healthy villages • Interlinked policy documents for PA: Initiatives from Ministries of Health, Sport, and Education • Ministry of Education's key role in corporate partnerships • Corporate collaboration for student physical activity: partnership with Muscat Pharmacy & Stores LLC for school sports funding <p>No monitoring of PA programs in the MoE</p> <ul style="list-style-type: none"> • Ministry of Health's leadership in physical activity surveillance through a comprehensive monitoring system <p>Economic challenges</p> <ul style="list-style-type: none"> • Lack of funding for physical activity programs • Lack of school facilities for physical activity and physical education <p>Political challenges</p> <ul style="list-style-type: none"> • Lack of collaboration between the health, sport and education sectors • Lack of support from the government <p>Environmental challenges</p> <ul style="list-style-type: none"> • Negative attitudes in the community towards physical activity • Desert environment • Students' lack of time for engaging in physical activity

Table 1 (continued)

Main themes	Sub-themes: Saudi Arabia	Sub-themes Oman
<p>Opportunities: future potential for implementation of PA policies and programs</p>	<p>Economic opportunities</p> <ul style="list-style-type: none"> - Investing in sports academies and programs for talent development and youth physical activity promotion - More government financial support for effective physical activity policies <p>Political opportunities</p> <ul style="list-style-type: none"> - Coordinating efforts and resources across sectors for efficient, effective, and sustainable physical activity policies and programs <p>Environmental opportunities</p> <ul style="list-style-type: none"> - Leveraging technology for personalized and engaging physical activity interventions 	<p>Economic opportunities</p> <ul style="list-style-type: none"> - More government financial support for effective physical activity policies - Enhancing physical activity facilities and workforce development <p>Political opportunities</p> <ul style="list-style-type: none"> - Governmental commitment to prioritizing physical activity in national plans - Coordinating efforts and resources across sectors for efficient, effective, and sustainable physical activity policies and programs <p>Environmental opportunities</p> <ul style="list-style-type: none"> - Promoting community participation in physical activity through local residents, schools, businesses and civil society organization

MoE: Ministry of Education, MoH: Ministry of Health, MoS: Ministry of Sport, PA: physical activity, HAP: Health in All Policies

* Information about the policy documents listed in this table is provided in the Results section

combined dataset encompassing both Saudi Arabia and Oman. A.A., A.B. and P.G. discussed the coding and the preliminary interpretations to cross-validate the findings. These themes were informed by a comprehensive analysis of the extant literature and relevant findings from previous studies [22, 24]. As a medical doctor at King Faisal Medical City in the southern region of Saudi Arabia, the lead author's professional background informed his approach to data analysis in this qualitative study.

Ethical approval

The study was approved by the Human Research Ethics Committee of the University of Technology Sydney (UTS HREC ref. no. ETH21-6428).

Results

Interviews were conducted with 19 high-level stakeholders in physical activity policy; 12 from Saudi Arabia and 7 from Oman. A total of four of the participants (two from each country) were women. In Saudi Arabia, four participants were from the Ministry of Health (MoH, including one from an NGO that is supervised by the MoH), five were from the Ministry of Education (MoE) and three represented the Ministry of Sport (MoS). In Oman, one participant represented the Ministry of Health, three were from the Ministry of Education and three were from the Ministry of Sport.

We generated six themes regarding physical activity policies in Saudi Arabia and Oman: leadership; existing policy documents; implementation of physical activity policies; challenges; data/monitoring for physical activity policies; and future opportunities. The theme non-profit sector/community groups was generated only for Saudi Arabia. Table 1 provides an overview of the derived main themes and findings.

Leadership

Saudi Arabia

Participants from the Saudi MoH and MoS stated that the leadership in the legislation, regulation, and evaluation of physical activity policies is divided between the two ministries. They also collaborate with other government agencies, including the MoE and the Ministry of Municipal and Rural Affairs, to increase physical activity opportunities in schools, workplaces and communities. Two participants from the MoE mentioned that the University Affairs Council and the Supreme Economic Council also work in the promotion of physical activity by regulating the implementation of programs in their sectors according to policy documents from the MoH and MoE.

According to the participant from the NGO supervised by the MoH, the non-profit sector is instrumental

in promoting physical activity through walking groups. These have been established throughout the country to provide opportunities for people to engage in physical activity and to socialize, and which are co-organized by various stakeholders, including local businesses, schools, healthcare providers and government agencies: "I firmly believe that the non-profit sector plays a pivotal role in advocating for physical activity in Saudi Arabia" (NGO participant).

Participants from the Saudi MoH underlined that Health in All Policies is one of the main objectives in the new health care transformation in the kingdom. Most participants from the three ministries identified a certain level of cooperation between different stakeholders, particularly between the Ministries of Health, Sport and Education.

Oman

The Omani MoH leads the policies and programs to promote physical activity. Participant 1 from the MoH said that their non-communicable disease (NCD) and Health Committees are crucial for leading policy-making and promoting physical activity related to the National Policy for Prevention and Control of NCDs document [30].

Regarding Health in All Policies, all participants from Oman stated that there is cooperation between the different ministries, but that it is limited and based on individual agencies' own initiatives rather than combined efforts or a policy imprimatur: "Partnerships exist, but they are limited and based on individual initiatives" (participant 2 from the MoS).

Relevant existing policies

Saudi Arabia

Most of the participants from all three ministries in Saudi Arabia referred to the Quality of Life document [31], an economic and social reform blueprint that is part of the government's overarching Saudi Vision 2030 development program [32]. The Quality of Life document includes the most important physical activity policies implemented by the three ministries: "There is no doubt that the 2030 Vision is our basic guidance" (participant 3 from the MoH). "Before 2017 there were no clear policies. Everyone works on vision files, and everyone has to achieve the [Vision 2030] target to increase the quality of life of the Saudi community" (participant 2 from the MoE). The Quality of Life document emphasizes the need to enhance public health and healthcare services, promote healthy behaviours, and provide opportunities for physical activity and sports participation.

Interviewees from the MoE highlighted that the University Sports Federation strategy promotes physical activity and sport in tertiary education [33]. Some

important miscellaneous policy documents were identified by staff of the three ministries, such as the National Strategy for Healthy Food and Physical Activity 2015–2025 [34], the Physical Activity Guidelines for Health Practitioners [35], the 24-Hour Movement Guidelines [36] (all by the MoH) and the annual report of the Sport for All Federation by the MoS [37].

Oman

Almost all participants across all three ministries stated that the government of Oman's overarching Vision 2040 [38] is currently the most important policy document. Participants from the MoE reported that the Vision 2040 guides the promotion of student physical activity, with support from related documents such as the student learning calendar, education document, standards document and the school sports curriculum. These policy documents aim to promote physical activity among students by better integrating physical education (PE) classes into the overall curriculum to encourage regular physical activity and healthy habits. According to participant 1 from the MoH, the Education Document is a comprehensive strategy, including PE and promotion of physical activity in schools and universities. The document outlines various initiatives, policies and guidelines to ensure that education includes a focus on physical health and fitness [39]. Three participants from the three different Omani ministries referred to the National Policy for Prevention and Control of NCDs [30], published by the MoH, as the central policy document for physical activity promotion in Oman. Three study participants from the MoS suggested that the Omani Sports Strategy [40] is important for guiding the promotion of physical activity for different segments of society.

Implementation of physical activity policies

(A) Physical activity programs

Saudi Arabia The MoH and MoE collaborate on a range of health-related issues (obesity, diabetes, mental health and visual acuity) to improve the overall health of school students and to detect problems at an early stage [41]. This led to the development of the Rashaka initiative, a large-scale multi-component school-based obesity prevention program, which started in 2016 and involved nearly 1000 schools across the country. In 2020, Rashaka was replaced by an annual program composed of screening of students for early signs of chronic diseases and lectures highlighting the significance of physical activity and a healthy diet.

Participants 3 and 4 of the Saudi MoH mentioned the Walk 30 Minutes initiative, which was implemented in 2021 and intends to increase physical activity through mass media and social media, and forms part of the National Strategy for Healthy Food and Physical Activity

2015–2025 of the MoH. An initiative by the University Sports Federation [33] (related to policies from the MoS), aiming to support sports facilities and clubs for girls and women, was mentioned by three participants from the MoS, and one participant highlighted the MoS's Talent Support Program to identify and develop talented athletes in different sports.

Participant 3 of the Saudi MoH and participant 5 of the MoE mentioned the Healthy Mall Campaign and the Healthy Campus Project to promote physical activity in air-conditioned malls and universities. These initiatives are related to policies of the National Strategy for Healthy Food and Physical Activity (MoH and MoE). Despite challenges, the study participants considered the Saudi physical activity programs to be effective.

Oman Participants 1 and 2 of the MoE identified programs related to PE policies from the Education Document, which include increasing the number of PE classes per week and organizing tournaments in different sports. According to participants from the three different ministries, a range of physical activity programs took place during the COVID-19 pandemic, including campaigns calling for physical activity at home using apps with exercise videos. These initiatives, as reported by the participants, align with and are supported by the physical activity policy documents from the Ministries of Health, Sport and Education, that is, the National Policy for Prevention and Control of NCDs [30] and the Oman Sport Strategy [40].

According to multiple participants, several community-based initiatives were underway in Oman, such as Active Community, Healthy Cities and Healthy Villages and The Green Playgrounds Project. These initiatives had been set up in all Omani cities to make the built environment more activity friendly, for example, by improving neighbourhood walkability, which is also based on the National Policy for Prevention and Control of NCDs [30].

(B) Private sector

Saudi Arabia According to most of the participants, the private sector makes important contributions to physical activity promotion in Saudi Arabia by being directly involved in the policy development process. The Tatweer Educational Company, a private holding dedicated to implementing the government's education reform initiative, has developed programs to promote physical activity in schools, aligning with its commitment to a holistic education system. In line with the conceptualization of active travel as physical activity, the Red Sea Company drives the development of Saudi Arabia's west coast and aims to improve neighbourhood walkability. Participants from the MoE were unanimous in the view that private universities make significant contributions to the promotion of

physical activity among staff and students on the basis of financial support from their funders. International and local investors in the education sector are urging private universities to promote physical activity to enhance the universities' reputation and to be more attractive for prospective students.

According to participant 1 from the Ministry of Health, walking and hiking groups supported by the Health Promotion Center [42] (a non-profit charitable organization under the umbrella of the Saudi Ministry of Labor and Social Affairs) play an important role in promoting physical activity in Saudi Arabia. This is despite a lack of governmental support, with influencers and celebrities utilizing social media platforms for the promotion of physical activity. This organization has internal policies for the promotion of physical activity through different programs: "The fact is that community groups working to spread this culture of walking have no ceilings, no limits, and no bureaucracy" (participant 1 from the MoH).

Oman In contrast to Saudi Arabia, participants in Oman stated that more support from the private sector is needed to promote physical activity in the country. However, participant 3 from the MoE mentioned an agreement between the MoE and Muscat Pharmacy & Stores limited liability company (LLC) to hold a football tournament for elementary school students. Nevertheless, it is important to highlight that there is a prevailing perception that physical activity cannot be easily monetized. This contributes to the private sector's limited interest in supporting such initiatives in the Gulf countries, as it is not perceived to yield immediate profits. Overall, the participants from both Saudi Arabia and Oman stated that, unlike in government-supported programs, in the private sector there are no performance indicators to track the progress of physical activity programs.

Data/monitoring

Saudi Arabia

Two participants from the Saudi MoH and MoE mentioned challenges in relation to physical activity monitoring, as each of the three involved ministries independently conducts surveys on physical activity with different methodologies and tools, which may yield conflicting results in monitoring the effects or end-product of physical activity policies. Furthermore, participants from all three ministries confirmed the existence of national surveys for physical activity and emphasized their importance in assessing activity levels. They also shared insights about how they monitor the implementation of physical activity policies and evaluate the effectiveness of various initiatives in their respective sectors: "We follow and evaluate health through periodic national

surveys, but each ministry has its own survey with different results. It is not clear how widely these data are utilized in different sectors, such as education, and sports, to inform policies and interventions" (participant 2 from the MoH).

Oman

Participants from the MoH and MoS stated that participation rates, policy compliance, budget allocation and health outcomes are being tracked to assess the effectiveness and progress of physical activity policies, with a specific focus on regular reports and data analysis. Furthermore, one participant from the MoE said that there is no monitoring happening for their education-specific policies.

Challenges

Saudi Arabia

Participant 4 from the MoH suggested that limited policy implementation is likely until the health transformation process is completed by 2030. The health transformation in Saudi Arabia is a recent, prominent project that aims to restructure the health sector to make it more comprehensive, effective and integrated. The transformation is mainly focussed on the prevention of chronic diseases and the promotion of a healthy lifestyle through physical activity and a nutritious diet. On the ground, this transformation entails significant changes in health-care infrastructure, delivery and accessibility, as well as increased awareness campaigns and the implementation of various programs aimed at improving public health and wellbeing [43]. To expedite the health transformation in Saudi Arabia, the respondent considered it essential to implement the policies from the Quality of Life document, which is part of the Kingdom's Vision 2030. This particularly involves promoting physical activity and healthy lifestyles. By fostering these habits, the country could achieve significant improvements in public health and wellbeing. Participant 3 suggested that bureaucracy is a limitation, as new policies and regulations take a long time to implement under different administrations. Moreover, participants from the MoH and MoE declared that a lack of sustainability of physical activity programs and funding were major limitations due to changes in administrations over short periods. Most participants representing the three Saudi ministries stated that a lack of collaboration and cooperation between government departments was a major challenge. For instance, some policies from the MoH need to be implemented by the MoE, such as the screening program of school students [41]. The hot climate and the desert environment in the Gulf region also present challenges when it comes to implementing physical activity policies.

According to most participants, a lack of funding for the promotion of physical activity was a common challenge in Saudi Arabia because health budgets are mostly allocated to hospitals and curative services rather than to NCD prevention, including physical activity promotion. A lack of facilities (e.g. sports fields, recreation centres, indoor and outdoor courts and multi-use sporting hubs) is a further challenge according to most Saudi respondents. Moreover, negative societal attitudes towards physical activity were highlighted by one participant, citing challenges such as the prevalence of social norms that prioritize sedentary pastimes and leisure activities, thereby reinforcing a culture that tends to discourage physical activity [44].

Oman

According to most participants, insufficient collaboration between different stakeholders, as well as a lack of government funding and support from the private sector, were the most important barriers to physical activity promotion. Like in Saudi Arabia, participants from Oman said that the hot climate and desert environment in the Gulf region, a lack of facilities and/or a lack of access to them and negative attitudes in the population towards physical activity (social norms that prioritize sedentary pastimes and leisure activities) all pose obstacles to physical activity. Some participants from the MoE stated that a lack of support for PE facilities in schools has been a major obstacle to increasing students' physical activity. Like in Saudi Arabia, respondents from Oman felt that the country should rapidly implement the provisions of the Vision 2040, specifically those related to the prevention of chronic diseases through the promotion of a healthy lifestyle and physical activity. Furthermore, an increase in government funding dedicated to promoting physical activity would be desirable.

Future opportunities

Saudi Arabia

Participant 3 from the Saudi MoH stated that future policies might include investment in technology, such as developing smartphone apps for the promotion of physical activity during pandemics, and these could contribute to future physical activity programs. However, this requires direct support from the government, both financially and technically, by providing technical expertise, developing and implementing technology-based solutions and ensuring privacy and security. Furthermore, participant 1 from the MoS and participant 3 of the MoE claimed that programs, such as out-of-school academies for talented young athletes, could further encourage physical activity and foster athletic talent. Three participants from the MoE pointed out that unifying efforts

between different stakeholders would be important. Moreover, more support in terms of funding, infrastructure, a skilled workforce, and research are considered promising opportunities by most participants from the three ministries.

Oman

Participants from the three ministries stated that community participation, such as activating schools as centres for physical activity promotion in the community, would be a great opportunity in the future if cooperation between different ministries is enhanced. Three participants from the Omani MoS and MoE said that improvements to facilities and the skills of the workforce (e.g. PE teachers, coaches, gym instructors, etc.) are required to increase activity levels. Despite the existence of the national plan for physical activity promotion in Oman [45], all participants emphasized that the lack of partnerships between the government and other relevant parties, such as schools, sports clubs and community organizations, is a common and significant obstacle. Furthermore, participant 1 from the MoS and participant 3 from the MoE said that more support for out-of-school sport academies, including improved collaboration between governmental agencies and the private sector, and supporting physical education as a part of the Omani education strategy, would be great opportunities.

Participants from the Ministries of Education of Saudi Arabia and Oman highlighted that physical education is crucial for the future in both countries, fostering healthy habits essential for a productive workforce. Integrating physical education into the curriculum promotes wellness and prevents lifestyle-related diseases, contributing to various sectors [39]. As both nations progress, emphasizing physical education will enhance individual health and serve as a strategic investment in a robust, dynamic workforce.

Discussion

This study examined cross-sectoral barriers and facilitators for physical activity policy development, implementation and evaluation in Saudi Arabia and Oman by interviewing high-level stakeholders from their Ministries of Health, Sports and Education. Oman established a national policy framework for physical activity in 2014 [18] under the umbrella of the Oman Vision 2040 [38], 3 years before Saudi Arabia introduced its Quality of Life Program [46] under the umbrella of the Saudi Vision 2030 [31]. Many programs and initiatives to enhance physical activity in both countries were identified, particularly sports initiatives. However, it is worth noting that these efforts often lack comprehensiveness, encompassing a broad range of activities and demographics, and face

challenges in effective implementation – observations that are in line with findings from a survey on national physical activity policies by Klepac Pogrmilovic et al. [8]. The programs and initiatives are predominantly focussed on urban areas and may neglect rural communities [44, 47]. Interest in promoting gender equity in physical activity in Oman was prominent, with several programs for female participants [24]; there was less focus on gender equity in Saudi Arabia, although a positive development was the introduction of PE classes for female students in primary and secondary education in 2018. Policies for promoting physical activity should also support individuals with special needs, patients and the elderly by implementing community programs targeted at these groups, such as walking groups and fitness classes for older adults, and programs targeting people with chronic conditions. Additionally, it is important to focus on policies and programs that support gender equality in physical activity and health.

Our finding regarding insufficient backing of policy interventions to create environments supportive of physical activity in both countries aligns with a study by Allender et al., who interviewed stakeholders in local government in Victoria, Australia, to analyse physical activity policies and initiatives. Similar to our findings from Saudi Arabia and Oman, they identified a lack of relevance and competing priorities (i.e. promoting healthy eating environments was not considered a priority above food safety) as reasons for the lack of support towards creating supportive environments for physical activity and healthy eating [48].

Health in All Policies has been embraced in Saudi Arabia by integrating the promotion of physical activity into policy development across various areas such as education, sports and the private sector. However, while this integration is mentioned in the respective documents, challenges in implementation may have arisen due to limited cooperation between sectors. Many partnerships have been established with multiple parties in the Kingdom (MoH, MoS, MoE, and the Ministry of Municipal and Rural Affairs) to further develop physical activity policies in each sector and to remove obstacles to the implementation of physical activity programs. According to a WHO report from 2017, promoting Health in All Policies in Saudi Arabia has been identified as a national priority, monitored by the Ministry of Health [49]. Intersectoral collaboration in Oman is apparently less developed than in Saudi Arabia, hindering the integration of physical activity policies across sectors. Unlike Saudi Arabia's comprehensive approach of Health in All Policies, Oman relies more on individual agency initiatives. However, there is potential for improvement in Oman to strengthen intersectoral collaboration and enhance the

integration of physical activity policies by establishing a comprehensive policy framework and promoting coordinated efforts among sectors. For instance, the Omani government could create an intersectoral task force or committee dedicated to fostering collaboration.

In Saudi Arabia, the non-profit sector, represented by community groups, plays a significant role in promoting physical activity outside of the government framework, aided by the promotion of physical activity by influencers and celebrities through social media platforms [42]. By contrast, our study participants did not mention any significant involvement of the non-profit sector in physical activity promotion in Oman, either because these types of organizations do not play a role or because their role is not valued by the government stakeholders who we interviewed. The private sector contributes to promoting physical activity in both countries, with particularly strong partnerships with the governmental sector in Saudi Arabia. This may be because tax benefits exist for companies that encourage and promote physical activity in Saudi Arabia [31]. There are previous examples of these types of partnerships in Oman, such as a collaboration between the education and private sector aiming to create a healthier environment and lifestyle in schools. These partnerships have been achieved through the provision of financial support and sponsorships, specifically targeting sports equipment, facilities and physical activity programs in schools [50]. However, insufficient budget allocation in this area was considered a challenge, which is consistent with our study, with most participants from the sultanate expressing the need for greater financial support from the private sector.

Policy limitations differ between both countries, mainly due to the health transformation in Saudi Arabia, specifically with the Kingdom's Vision 2030 [51]. The slow pace of transformation in various Saudi public health, infrastructure, urban planning, sports and recreation policies may impact their likelihood of being fully implemented by 2030, potentially falling short of WHO's target for increased physical activity by that year set in their Global Action Plan on Physical Activity [52]. One of the objectives of the health sector transformation and the Quality of Life Program is to decrease the proportion of the Saudi population who are not sufficiently physically active below (67%) by 2030 [51]. The government has taken proactive measures to promote physical activity, investing in initiatives that raise awareness about its importance and the associated health benefits. This includes campaigns, public awareness programs and the establishment of recreational facilities to facilitate physical activity. In Oman, more collaboration between political parties is essential to improve the implementation of physical activity

policies. According to participant 1 from the Omani MoH, several meetings were recently held with all parties to create plans to better implement physical activity policies. These meetings have led to increased monitoring and stricter enforcement by the Omani government regarding the implementation of physical activity policies in all relevant ministries. Effective health system policies significantly depend on inter-institutional collaboration. While primary health institutions play a central role, the impact of related entities is equally crucial. Educational bodies, sports organizations and community health centres contribute significantly to decision-making processes. Their closer involvement would ensure a more comprehensive approach to promoting physical activity, enhancing wellness and preventing lifestyle-related diseases [53].

According to previous studies, insufficient funding for promoting physical activity, and more broadly for NCD prevention, is a challenge in both Saudi Arabia and Oman [23, 24]. Similarly, in a US study, state public health practitioners were interviewed about the National Physical Activity Plan, who also identified implementation costs and the complexity of physical activity policies as significant challenges [54]. Financial incentives and private sector involvement, while valuable, do not ensure adequate funding for all aspects of public health initiatives. The private sector's contribution is often focussed on areas aligned with their business interests or corporate social responsibility. Nevertheless, in Saudi Arabia, certain private sector companies run national programs, such as the Tatweer Educational Company, a private holding dedicated to implementing the government's education reform initiative [55, 56]. Enhancing funding for the implementation of physical activity policies in the Gulf region holds great promise in advancing infrastructure, cultivating a proficient workforce, and fostering research initiatives. On the basis of the Saudi Quality of Life document 2030 [46], the budget of the Ministries of Health, Sport and Education for promoting physical activity will likely increase until 2030.

The monitoring and evaluation of policy implementation across ministries in both countries is challenging due to the absence of comprehensive and precise data on physical activity prevalence in key sectors such as health, sport and education. Therefore, there is an urgent need to address data quality issues, such as inconsistent measurement methods employed across different sectors, which make it difficult to compare and consolidate data, and the lack of standardized protocols which undermines the accuracy and reliability of prevalence estimates. To efficiently monitor policy implementation, the responsibility could, for instance, be entrusted to the MoH for coordination with all pertinent sectors, while the General

Statistics Authority should be designated to collect data on physical activity.

Responsibility for ensuring data quality rests with various stakeholders involved in the data collection, including researchers, survey administrators, data analysts and policy-makers. These stakeholders must work collectively to implement robust data collection methodologies, appropriate sampling techniques, rigorous quality control measures and transparent reporting practices. Monitoring of the impact of policies on population levels of physical activity in Saudi Arabia and Oman has improved, but more work is needed, particularly in the education sector in Oman, which requires evaluation of the progress and impact of policies.

To create and implement comprehensive policies, programs and supporting environments, a variety of sectors must collaborate in both countries. This may include transport, urban planning, media, social work, religious and cultural affairs [23]. In Saudi Arabia, one of the most effective health-promoting practices is physician-recommended physical activity [57], which is recognized as one of the eight best investments for physical activity by the International Society for Physical Activity and Health [58]. Therefore, the primary healthcare system in the Gulf region has a critical role in the promotion of physical activity, and further policy development in this area would be promising [57]. In addition, physical education policies in schools play an integral part in the Gulf states [59]. Educational institutions in Saudi Arabia and Oman are crucial in promoting physical activity among various age groups. From childhood through adolescence to young adulthood, schools offer structured physical education programs, health education and gender-inclusive activities. Universities support these efforts by providing sports facilities and activities as well as by conducting research on active lifestyles. Coordinated national policies amplify the effectiveness of these initiatives [22, 39, 60]. Furthermore, active transport and urban design policies have not yet been developed sufficiently to become potential contributors to population levels of physical activity in these countries due to cultural, environmental and climatic differences [23].

Strengths and limitations

Strengths of this study include a sample of high-level stakeholders who are directly involved in the formulation of physical activity policies from three ministries in Saudi Arabia and Oman, the two largest countries in the GCC. Additionally, we recruited one prominent participant from an NGO that is supervised by the Saudi Ministry of Health. We were not able to reach participants from the non-governmental sector in Oman. The original research plan was targeted at all six member countries of the Gulf

Cooperation Council, but we were not able to recruit participants from the other GCC states due to political sensitivities surrounding the subject and a lack of responsiveness from relevant authorities. This may limit the generalizability of our findings beyond these specific contexts. However, we managed to recruit senior participants from the two largest GCC countries, which account for 70% of the GCC population. As in many countries, governmental representatives may have been constrained in what they reported in these interviews. Regarding the limitation of interview responses, some participants spoke about the existence of physical activity policies but did not want to provide further information on how they are being implemented, and this kind of information is not easy to obtain from other sources either. Thus, these gaps constitute a need for future research. To ensure research quality based on Lincoln and Guba's criteria [61], we implemented several strategies. For credibility, we used investigator triangulation (involving multiple researchers) and theoretical triangulation (utilizing multiple policy frameworks). We did not use methodological triangulation, as we only conducted interviews, nor data triangulation, relying solely on audio transcripts. To ensure dependability, we kept detailed records of data collection and assessed coding accuracy and reliability among our team. For transferability, we addressed inherent challenges by collecting data from two countries, Saudi Arabia and Oman, enhancing the applicability of our findings to similar contexts. Although achieving confirmability was challenging due to our focus on individual perceptions, we aimed for transparency and objectivity in documenting our procedures and decisions.

Conclusions

This study fills important gaps in the analysis of physical activity policies in the Gulf region. Understanding the unique challenges, barriers and successes in promoting physical activity in the GCC countries is essential for developing relevant policies and strategies in the future. Our study highlights the importance of increasing financial support, improving collaboration between governmental agencies and between them and the private sector, and consolidating efforts to back physical activity policies and dismantle cross-sectoral barriers in Saudi Arabia and Oman. Educational institutions in Saudi Arabia and Oman play a crucial role in promoting physical activity from early childhood to young adults. Schools offer structured physical education, health education and gender-inclusive activities, while universities provide sport facilities and conduct research on active lifestyles. Coordinated national policies enhance the effectiveness of these efforts.

Specifically, we recommend allocating dedicated funds, establishing a centralized task force for coordinated

policy implementation, creating incentives for private sector investment, developing a national strategy with measurable targets and conducting comprehensive policy reviews to remove bureaucratic obstacles. These steps will facilitate sustained progress and broader engagement in physical activity initiatives.

Our findings provide valuable insights and evidence for policy-makers, public health officials and other stakeholders in the region to develop targeted policies, programs and interventions that promote physical activity and prevent non-communicable diseases. The identified challenges and limitations of physical activity policies in Saudi Arabia and Oman will guide their future development.

Abbreviations

COVID-19	Coronavirus disease 2019
GCC	Gulf Cooperation Council
HIAP	Health in all policies
LLC	Limited liability company
MoE	Ministry of Education
MoH	Ministry of Health
MoS	Ministry of Sport
NCD	Non-communicable disease
NGO	Non-governmental organization
PA	Physical activity
PE	Physical education
UAE	United Arab Emirates
US	United States
WHO	World Health Organization

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12961-024-01192-w>.

Supplementary material 1.

Supplementary material 2.

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Author contributions

A.A. recruited participants and conducted interviews with policy-makers. A.A., A.B. and P.G. collectively analysed the transcripts. K.G., A.B. and P.G. made significant contributions to the thorough review and editing of the manuscript.

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Availability of data and materials

The datasets generated and/or analysed during the current study are not publicly available to maintain participants' confidentiality. However, they can be obtained from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

The study was approved by the Human Research Ethics Committee of the University of Technology Sydney (UTS HREC ref. no. ETH21-6428).

Competing interests

The authors declare that they have no competing interests.

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CHAPTER

5

5 STUDY 2




Physical activity policies in the Gulf Cooperation Council countries: A qualitative study with document analysis

5.1 Overview

This chapter, representing the second study of this thesis, is a paper with an in-depth examination of physical activity policy documents across all six Gulf Cooperation Council (GCC) countries: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE. The paper provides a comprehensive analysis of how each country formulates, implements, and evaluates its physical activity policies [128].

5.2 Study 2: Physical activity policies in the Gulf Cooperation Council countries: A qualitative study with document analysis

Physical activity policies in the six Gulf Cooperation Council countries: a qualitative study with document analysis

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ABSTRACT

Background The Gulf states have some of the lowest physical activity levels and some of the highest obesity rates globally. Understanding physical activity policies is important but under-researched in this region.

Purpose To analyse physical activity policies in terms of structures, formulation, implementation and evaluation in the six Gulf Cooperation Council (GCC) member countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates (UAE)).

Methods We systematically searched the websites of the Ministries of Health, Education, Sport, Transport, Tourism and Municipal Affairs of the GCC countries between March 2023 and February 2024 for documents related to physical activity policy. Experts from Saudi Arabia, Oman and Bahrain were consulted to identify unpublished documents. Desk research questions from the Health-Enhancing Physical Activity Policy Audit Tool were used to evaluate the content of these documents in terms of the policy cycle model.

Results We identified 39 policy documents from the six countries. Comparative analysis revealed centralised governance across GCC nations, except for the UAE's federal monarchy system. Policy formulation typically involves collaboration among health, sports and education ministries, although responsibilities vary. There were no sedentary behaviour reduction policies. Policy implementation lacks funding, especially for marginalised groups such as individuals with disabilities and immigrants. Evaluation lacks economic assessment.

Conclusions Our study revealed a lack of implementation of physical activity policies and a general dearth of policies aimed at reducing sedentary behaviour within the GCC. Enhancing transparency, inclusion and evaluation mechanisms are essential for fostering effective physical activity policies in GCC countries.

Practical implications Our study provides impetus for policy-makers in the Gulf region to develop policies addressing sedentary behaviour and improving the evaluation framework. Additionally, it serves as a foundation for researchers to identify and address gaps in future policy analysis, contributing to the advancement of effective strategies for promoting physical activity.

WHAT IS ALREADY KNOWN ON THIS TOPIC

- The Gulf states have low physical activity levels and high obesity rates.
- Physical activity policies are crucial for addressing the physical inactivity epidemic, but they are under-researched in the Gulf region.

WHAT THIS STUDY ADDS

- Most comprehensive analysis to date of physical activity policies in the Gulf Cooperation Council (GCC) countries.
- Comparative analysis revealed centralised physical activity governance across GCC nations, except for the United Arab Emirates' federal monarchy system.
- Policy formulation typically involves collaboration among health, sports and education ministries, although responsibilities vary.
- There were no sedentary behaviour reduction policies.
- Policy implementation lacks funding, particularly for marginalised groups, such as individuals with disabilities and immigrants, the latter accounting for 52% of the GCC population.
- Evaluation lacks economic assessment.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- Calls for greater transparency, inclusivity and evaluation of physical activity policies.
- Encourages the development of policies that target sedentary behaviour and immigrants.
- Provides a foundation for future research to address policy gaps.

BACKGROUND

Physical activity (PA) is important in the prevention and management of non-communicable diseases (NCDs)¹ and improves mental health, quality of life and overall well-being.^{2–4} However, globally large parts of the population are not sufficiently active.^{5,6} Countries in the Middle East have some of the highest rates of physical inactivity



and obesity,⁵⁻⁷ which is also associated with a large economic burden from NCDs.⁸ For instance, more than two-thirds of adults in Kuwait and Saudi Arabia are not sufficiently physically active.⁵⁻⁷ Furthermore, more than 80% of adolescents in Bahrain, Kuwait, Oman, Qatar and the United Arab Emirates (UAE) fail to meet the recommended levels of PA.⁶ In line with social-ecological models⁹ and systems theory,¹⁰ policies play an important role in promoting PA.^{11,12} Therefore, it is essential to evaluate PA policies in the Gulf countries to develop effective and targeted interventions.

Policy measures to encourage PA are of interest to academics and policy-makers in the public and private sectors¹⁵ as policy actions that affect lifestyle behaviours can improve the health of whole populations.¹⁴ Measures include infrastructure to support active transportation, establishing safe environments for leisure activities, instituting physical education programmes in schools and promoting wellness initiatives in workplaces.¹⁵ In 2018, the WHO published the *Global Action Plan on Physical Activity (GAPPA) 2018-2030* to provide guidance and a framework of effective and achievable policy initiatives to increase levels of PA.¹⁵ According to GAPPA, investing in policies that promote walking, cycling, active recreation and sport can contribute to multiple UN (United Nations) Sustainable Development Goals.^{15,16} The 20 policy initiatives outlined in GAPPA aim to realise four overarching goals: to create active systems, active people, active environments and active societies.¹⁵ According to WHO's 2022 Global Status Report on Physical Activity, the percentage of countries with a PA policy, strategy or action plan is the highest in the European Region (64%), compared with only 48% in the Eastern Mediterranean Region.¹⁷ Therefore, countries in the Middle East need to develop, implement and evaluate PA policies to align with GAPPA and tackle rising inactivity rates.

Despite the high inactivity rates in the Middle East, its policy environment has received little recent scrutiny. In 2014, the latest report by WHO focused on promoting PA in the Eastern Mediterranean Region and detailed PA policies across Middle Eastern countries using the Health Enhancing Physical Activity Policy Audit Tool (HEPA-PAT).¹⁸ According to WHO's 2022 Global Status Report on Physical Activity, there has been substantial progress since 2014, particularly in the six countries that comprise the Gulf Cooperation Council (GCC), namely Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE. One more recent review of country-level PA policies omitted an analysis of the Gulf region.¹² Conducting a cross-sectional analysis, the Global Observatory for Physical Activity (GoPA!) approached contacts from 173 countries, and 76 of them provided data on their national PA and sedentary behaviour policies through the GoPA! Policy Inventory. However, in this study, the GCC countries did not supply any data regarding their PA policies.¹² This warrants a more thorough investigation of PA policies in the Gulf region.

While there have been some more recent studies examining the PA policies in individual GCC countries, they had limitations, such as not including a broad range of documents, only focusing on the policy work of one ministry or consulting only a narrow range of key informants.^{19,20} In order to address some of the shortcomings of previous analyses, in this study, we examined a broader range of documents from all six GCC countries. We analysed policy-making structures²¹ (governmental and national organisations), agenda-setting (surveillance or monitoring systems), policy formulation (national PA policy development), decision-making (policy decision processes), policy implementation (PA policy execution framework) using an established PA for this purpose.^{14,22}

METHODS

Document retrieval

A systematic online search for documents containing PA policies was undertaken on the websites of the Ministries of Health, Education, Sport, Transport, Tourism, Municipal and Rural Affairs, Recreation and Leisure, Environment, Work and Employment, and Finance for all six GCC countries between March 2023 and February 2024. These ministries were selected as they have been shown to have portfolios relevant to PA.²¹ We included documents that contained any policy aimed at promoting PA and that were published in Arabic or English. For a previous study,²¹ we consulted PA experts from the Ministries of Health, Education and Sport in Saudi Arabia, Oman and Bahrain to identify other relevant unpublished documents. We made multiple attempts to contact stakeholders from these ministries in the UAE, Qatar and Kuwait; however, we did not receive any response. AA was responsible for conducting the document search and for translating content from Arabic to English. Notably, this study analyses publicly accessible documents from government websites across all Gulf countries and, therefore, did not require ethical approval.

Document analysis

The aim of our analysis was to understand how PA policies are developed, implemented and evaluated, thus contributing to knowledge by identifying strengths, gaps and opportunities in existing policies and thereby informing future policy development and public health strategies. AA analysed the policy documents under the guidance of PG, AB and AG, who have expertise in PA policies and qualitative research. We applied elements of the HEPA-PAT²³ to examine relevant policies in the GCC countries. The HEPA-PAT offers a thorough framework for assessing the breadth, details and execution of PA policies, making it particularly suitable for comparing policy landscapes across different regions. Following Celius *et al*, who analysed PA policies in four countries in Europe, we divided the questions from the HEPA-PAT into three groups: (1) Data available via existing national government surveys; (2) Data retrievable via desk research and

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Criteria based on the policy cycle model	Topic/indicator (PAT questions)	No
Policy-making structures	(1) What is the government structure?	1a
	(2) What are the main government ministries?	1c
	(3) What are the other important national organisations?	1d
Agenda-setting	(1) Is there a surveillance or monitoring system in place?	20
Policy formulation	(1) Who is the identified leadership for PA promotion at the national level?	2
	(2) Is there cross-sectoral collaboration at the national level?	4
	(3) What is the evidence base of key policy documents?	10
	(4) Are there national recommendations on PA and health?	17a
	(5) Are there national recommendations on reducing sedentary behaviour?	17b
	(6) What are the national goals or targets for population prevalence of PA?	18
	(7) Are there other goals and targets that directly or indirectly relate to PA?	19
Decision-making	(1) What are the current key policy documents, legislation, strategies or action plans?	7
	(2) Is a consultative process used in decision-making?	8
	(3) Is there evidence of cross-referencing and alignment within and between policies?	9
Policy implementation	(1) What settings are included for the delivery of specific PA policy actions?	13
	(2) Which populations are targeted by specific PA policy actions?	14
	(3) What are some examples of large-scale programmes?	16
	(4) Is there funding available at the national level?	24a
Evaluation	(1) Is there a health surveillance or monitoring system in place?	20
	(2) Has there been an economic evaluation of interventions or physical inactivity?	23
	(3) Is evaluation conducted at the national level?	22a
	(4) Is there monitoring of policy implementation and delivery?	27a
Others	Further details or comments	29

PA, physical activity; PAT, Policy Audit Tool.

(3) Expert opinion.¹⁴ Due to the limited responsiveness of policy-makers in some of the Gulf countries, notably in the UAE, Qatar and Kuwait, we could not apply all components of the HEPA-PAT. Therefore, we used the PAT questions which may be answered through desk research (data groups 1 and 2, see table 1). For standardisation, we focused on national level documents, as these reflect the centralised policy directions that significantly impact regional outcomes.

In line with Gelius *et al.*,¹⁴ the PAT questions were allocated across the six categories of the policy cycle model, which we used as a framework for the analytical themes in the document analysis.²⁴ This model categorises the policy-making process into six stages: policy-making structures, agenda-setting, policy formulation, decision-making, policy implementation and evaluation (table 1). The policy cycle model assumes that the stages will be repeated as policies are improved and adapted to different contexts.²⁴ The main advantage in analysing PA policies using this model is that it divides the policy-making process into different phases, assisting policy-makers to think systematically about the process, identify key stakeholders and pinpoint critical moments

for intervention and evaluation.¹⁴ We employed content analysis within a constructivist paradigm to systematically examine and interpret PA policy documents in the GCC countries.^{14 25} This approach allowed us to identify key themes and insights, while the constructivist paradigm provided a framework for understanding the sociopolitical contexts and subjective meanings embedded within these policies. To enhance the trustworthiness and credibility of the data analysis, we maintained an audit trail to document the research process and decisions made throughout the analysis. We used the Standards for Reporting Qualitative Research checklist to ensure the rigour and transparency of our qualitative methods (online supplemental appendix 1).²⁶

RESULTS

We identified 39 policy documents from the six GCC states (table 2). Qatar and Saudi Arabia have central documents that include policies and programmes aimed at achieving national PA targets by 2030, while Oman has similar central documents targeting 2040. By contrast, the other GCC countries have separate documents, with

Table 2 Policy documents related to physical activity promotion in GCC countries

Country	Central documents	Non-central documents	Key objectives
Bahrain	None	<ul style="list-style-type: none"> National Action Plan for control and prevention of non-communicable diseases (قانون مكافحة الأمراض غير المعدية)⁵⁰ Detailed Strategic Plan for youth and sport (الخطة الاستراتيجية التفصيلية للشباب والرياضة)⁵⁵ Teacher's guide for physical education (دليل المعلم للتربية البدنية)⁵⁹ National Strategy for diet and physical activity (الاستراتيجية الوطنية للتغذية والنشاط البدني)³⁰ 	<ul style="list-style-type: none"> Reducing NCDs Promoting healthy habits Supporting physical education teachers and youth sports
Kuwait	None	<ul style="list-style-type: none"> The national policy for prevention and control of NCDs (السياسة الوطنية للوقاية والتحكم في الأمراض غير المعدية)³⁴ Physical education policy in schools (السياسة الوطنية للتربية البدنية في المدارس)⁶⁰ National Youth Policy (السياسة الوطنية للشباب)⁶¹ 	<ul style="list-style-type: none"> Reducing NCDs Enhancing physical education in schools Supporting youth PA involvement
Oman	Oman's vision 2040 (رؤية عمان 2040) ⁶⁴	<ul style="list-style-type: none"> The national policy for prevention and control of NCDs (السياسة الوطنية للوقاية والتحكم في الأمراض غير المعدية)³¹ The physical education standards document (الوثيقة المعيارية للتربية البدنية)⁶² Student Learning Calendar Document (الوثيقة المعيارية لتقويم الطلاب)⁶³ The 21st Century Skills Document in the Omani Curriculum (الوثيقة المعيارية للمهارات في المناهج الدراسية)⁶⁴ School sports curriculum (المناهج الدراسية للرياضة المدرسية)⁶⁵ The Omani sports strategy (الاستراتيجية الوطنية للرياضة)⁶⁶ General concepts of the curriculum in the Sultanate of Oman (المفاهيم العامة للمناهج الدراسية في سلطنة عمان)⁶⁷ National nutrition strategy in Oman (الاستراتيجية الوطنية للتغذية في سلطنة عمان)⁶⁸ 	<ul style="list-style-type: none"> Health promotion Addressing PA determinants Enhancing student PA Developing sport systems and infrastructure
Qatar	<ul style="list-style-type: none"> Qatar's National Vision 2030 (رؤية قطر الوطنية 2030)⁶⁹ Qatar National Development Strategy (الاستراتيجية الوطنية للتنمية)⁷⁰ 	<ul style="list-style-type: none"> Qatar National Nutrition and Physical Activity Action Plan (الخطة الوطنية للتغذية والنشاط البدني)³² Qatar National Physical Activity Guidelines (الخطوات الإرشادية للنشاط البدني)⁴¹ Qatar Public Health Strategy (الاستراتيجية الوطنية للصحة العامة)⁴² Assessment of the fitness level of public school students in the State of Qatar (تقييم مستوى اللياقة البدنية لطلاب المدارس الحكومية في دولة قطر)⁷² Sports Sector Strategy (الاستراتيجية القطاعية للرياضة)⁷³ 	<ul style="list-style-type: none"> Promoting healthy lifestyles Increasing community involvement in sports and PA
Saudi Arabia	Quality of Life Program 2020 - Vision 2030 (برنامج جودة الحياة 2020 - رؤية 2030) ⁷⁴	<ul style="list-style-type: none"> The National Diet & Physical Activity Strategy (DPAS) 2015-2025 (الاستراتيجية الوطنية للتغذية والنشاط البدني 2015-2025)²⁹ Obesity Control & Prevention Strategy 2030- Public Health Authority (الاستراتيجية الوطنية للوقاية والتحكم في السمنة 2030 - الهيئة العامة للصحة العامة)⁴¹ Saudi Diabetes Clinical Practice Guidelines-Saudi Health council (دليل الممارسة السريرية لمرض السكري في المملكة العربية السعودية - المجلس السعودي للصحة العامة)⁷⁴ Annual Report 2020 - Saudi Sports for All Federation (التقرير السنوي 2020 - الفيدرالية السعودية للرياضة للجميع)⁷⁵ Exploratory examination - Ministry of Health (الدراسة الاستكشافية - وزارة الصحة)⁷⁶ University Sports Federation strategy (الاستراتيجية الفيدرالية للرياضة الجامعية)⁷⁷ Physical Activity guideline for Health Practitioners (دليل الممارسة للنشاط البدني للممارسين الصحيين)⁷⁸ 24-Hour Movement Guidance for Saudi Arabia (التوجيهات الحركية لـ 24 ساعة للمملكة العربية السعودية)⁷⁹ The KAYL Association for Combatting Obesity (الجمعية الكي ال كاي ال للوقاية من السمنة)⁸⁰ 	<ul style="list-style-type: none"> Achieving Vision 2030 Promoting PA through multisectoral collaboration Providing practical guidelines for health professionals

Continued

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Country	Central documents	Non-central documents	Key objectives
UAE	None	<ul style="list-style-type: none"> ▶ The national policy for prevention and control of NCDs (تخطيط) (استراتيجية الصحة العامة للوقاية والتحكم في الأمراض المزمنة غير المعدية) ▶ National nutrition strategy (استراتيجية التغذية) ▶ Physical and health education (التربية البدنية والصحية) ▶ National nutrition guidelines UAE (توجيهات التغذية الوطنية في الإمارات العربية المتحدة) ▶ Abu Dhabi sport council strategic plan (الخطة الاستراتيجية لمجلس أبوظبي الرياضي) ▶ Sports for All policy (سياسة الرياضة للجميع) 	<ul style="list-style-type: none"> ▶ Promoting PA and healthy eating habits ▶ Incorporating PA in school curriculum ▶ Developing sports and PA in the region

GCC, Gulf Cooperation Council; KAYL, Kyle Charitable Association for Combating Obesity; MOH, Ministry of Health; NCDs, non-communicable diseases.

each ministry maintaining its own policies rather than consolidating them into a central document. All of the relevant documents in all six countries were published by the Ministries of Health, Sport and Education, respectively.

Policy-making structures

The government structure in the GCC states is central (monarchy), except for the UAE, which have a federal constitutional monarchy, with substantial competence over health policy resting with the governments of the seven individual emirates.^{27, 28} According to 20 out of 39 documents in the Gulf countries, the Ministries of Health in the region have the most prominent role in leading all sectors to increase population levels of PA. To implement policies and develop programmes and interventions that promote PA, other ministries, such as Sports, Education and Municipal Affairs, collaborate through annual committees in coordination with the Ministry of Health (MoH). However, while in Saudi Arabia the MoH holds the official mandate for PA, a substantial amount of this work is facilitated through the sports sector. In addition, the private sector and non-governmental organisations (NGOs) cooperate with various ministries in the Gulf to implement PA policies. For example, private fitness centres may collaborate with health departments on public health initiatives, and community fitness events may be co-organised with government agencies for broader outreach into promoting active lifestyles and raising awareness about the benefits of PA among the general public.^{19, 20}

Agenda-setting

Agenda-setting in PA policy is supported by the presence of surveillance and monitoring systems to track and evaluate health outcomes. All six GCC countries have national systems to monitor PA levels in the population. For example, the Saudi Health Information Survey,²⁹ the Chronic Diseases Health Survey in Bahrain,³⁰ the National Physical Activity Monitoring System in Oman,³¹ the Nutrition and PA Surveillance and Monitoring System in Qatar³² and the National Nutrition and PA Surveillance System in the UAE³³ were developed to collect data on social, economic and health-related factors, including

those pertaining to PA. In contrast to the other countries, Kuwait uses the STEPwise approach to NCD risk factor surveillance 'STEPS' survey in Kuwait,³⁴ provided by WHO, which supports countries that lack existing monitoring systems, have insufficient capacity to develop their own, or seek international comparability.³⁵ In 2014, the GCC countries completed the HEPA-PAT provided by the WHO Regional Office for the Eastern Mediterranean.¹⁸ Furthermore, experts from Gulf countries contribute to the GoPA. These representatives come from various sectors, including the MoH in Saudi Arabia and academia in Bahrain, Oman, Qatar and the UAE. However, there is no representative from Kuwait.³⁶ Additionally, all GCC countries are members of the Gulf Health Council, which conducts activities such as organising community fitness events, implementing public awareness campaigns and establishing guidelines for PA promotion to monitor and promote PA across the Gulf region.³⁷ Robust monitoring and surveillance systems are key to setting agendas and ensuring the effectiveness of PA policies.

Policy formulation

All GCC countries have established national targets for the population-level prevalence of PA. As outlined in the diet and PA strategy documents for all GCC states, the goal for 2025 is to achieve a 15% relative reduction in the prevalence of insufficient PA, in line with the WHO's global voluntary targets for NCDs.^{15, 29, 31, 32, 34, 38, 39} However, while these documents do contain national recommendations regarding PA and health, there is a notable absence of any guidance regarding the reduction of sedentary behaviour.

In Saudi Arabia, the Ministries of Health and Sport share the leadership in policy formulation for PA promotion, with minor contributions from the Ministry of Education. Multisectorial committees led by the Ministries of Health and Sport have developed PA policy drafts under the Quality of Life Program and Vision 2030 for the Kingdom of Saudi Arabia.^{29, 40} Recently, the Public Health Authority, a unit of the Saudi MoH, had a prominent role in formulating and implementing comprehensive PA policies and guidelines.⁴¹ In Oman, the leadership in PA policy formulation is mainly shared between the Ministries of Health



Table 3 Cross-sectoral collaborations for PA policy formulation in each Gulf country

Country	Key stakeholders involved	Example policies
Bahrain	Supreme National Committee to Control NCDs (including various governmental and non-governmental sectors)	NCD and Physical Activity Promotion: Policies involving comprehensive participation from all relevant sectors to prevent NCDs and promote physical activity.
Kuwait	Ministry of Health (Health Promotion Administration), School Health Administration, General Authority for Sports	National Physical Activity Strategy: A policy implemented through collaboration with school health services and sports authorities.
Oman	Ministries of Health, Culture, Sports, Youth, Housing, Urban Planning, Public Authority for Radio and Television	National Physical Activity and NCD Prevention Policies: Formulated through collaboration across these ministries and authorities.
Qatar	Ministries of Public Health, Education, Higher Education, Municipality, Environment, Economy, Youth, Sport, Labour	Physical Activity Promotion Policies: Joint policies developed by these ministries to enhance physical activity levels in the community.
Saudi Arabia	Ministries of Health, Sport, Education, Food and Drug Authority	Exploratory Examination: A policy in primary, middle, and secondary schools promoting healthy lifestyles and physical activity, coordinated by the Ministries of Education and Health. Diet and Physical Activity Strategy: A policy developed through coordination between the Ministries of Health, Sport and the Saudi Food and Drug Authority.
UAE	Ministry of Health (Department of Health Education and Promotion), Ministry of Education, Public Authority for Youth Welfare, Municipal Affairs	Community Physical Activity Policies: Policies aimed at increasing physical activity through cooperation between education, youth welfare and municipal authorities.

NCD, non-communicable disease; PA, physical activity.

and Education.³¹ In Bahrain, Kuwait, Qatar and the UAE, the MoH prepares policies, strategies and plans for PA promotion to guide other sectors in the state.^{32-34,38-39} All Gulf states engage in cross-sectoral collaborations at the national level to formulate comprehensive PA policies. While some collaborations are institutionalised through formal agreements between ministries and other sectors, others remain more ad hoc, depending on specific projects or initiatives. Table 3 summarises the cross-sectoral collaborations for PA policy formulation in each Gulf country.

Decision-making

In the Gulf countries, formulated policies are generally approved and agreed on by specific councils and committees which are led by the head of state or their deputy and which comprise all ministries responsible for or impacted by these policies. For instance, the Council of Economic and Development Affairs in Saudi Arabia⁴⁰ and the Multi-sectoral National Committee in Oman³¹ approve policies, including those related to PA. The GCC countries' policy documents undergo stakeholder consultation and show evidence of alignment and cross-referencing with other relevant policies to ensure consistency and integration. In Oman, Qatar and Saudi Arabia, central policy documents, such as Oman's Vision 2040, Qatar's National Vision 2030, and Saudi Arabia's Quality of Life Program 2020 and Vision 2030, guide the promotion of PA. However, no central guiding policy document was found in Bahrain, Kuwait or the UAE. We also found

evidence of cross-referencing between health, sports and education policies across all GCC countries to ensure a coordinated approach to promoting PA. Table 2 provides a summary of the key policy documents identified across the GCC countries, highlighting their primary objectives.

Policy implementation

PA policies are implemented in a range of settings, including kindergartens, primary schools, high schools, colleges/universities, primary healthcare facilities, clinical healthcare facilities, workplaces, senior/older adult services, and sport and leisure facilities.^{31,34,38-40,42} The HEPA initiatives in all GCC countries specifically target the following groups: children/young people, older adults, chronic disease patients and families. Other groups, such as employees, women and the general population, are also targeted in all Gulf states, though with fewer suggested actions. However, there are no apparent strategies for promoting PA among people with disabilities and migrant populations.

Every GCC member state has a communication plan, using mass media at a national level to promote PA. Table 4 provides a concise summary of the main PA campaigns and initiatives in each GCC country, highlighting their objectives and the leading organisations responsible for their implementation.

In the Gulf states, funding for programmes aimed at promoting PA is provided at the national level, guided by policy documents that outline the governments' commitment to promoting public health and well-being through



Table 4 Key physical activity campaigns and initiatives in each GCC country

Country	Campaign/initiative	Lead organisation	Description
Bahrain	Exercise Mindfully (ايغوب ضيرت)	General Sports Authority	Encourages mindful engagement in physical activities through social media tips and guidance for practitioners.
Kuwait	Stay Active for Kuwait (اطنين قبا) (شيولعل لجا زم)	Ministry of Health & Kuwait Physical Therapy Association	Social media campaign aimed at increasing awareness about the benefits of physical activity.
Oman	Sports Ambassadors Program (قضايرول اءارفس جمنرب)	Ministry of Culture, Sports and Youth	Trains candidates in the Ministries of Sports, Education, and Health to enhance physical activity awareness and communicate this effectively.
Qatar	Your Health First (الوا لمتحص)	Ministry of Public Health	Provides free fitness sessions through the Fitness Box programme in parks and venues to promote community health and physical activity.
Saudi Arabia	Walk 30 Campaign (30 شدم)	Ministry of Health	Encourages people to walk for 30 min daily.
	Start Now Campaign (انبا قلمج) (زالا)	Ministry of Sport	Promotes nationwide engagement in physical activity, leveraging social media and official channels to reach diverse demographics.
	Social media campaigns (شالمج) (لصاوتلا لىاسرو ربع ذورنتم ايخامج لال)	Public Enthusiasts	Selected passionate individuals engage with the community to promote physical activity through various media.
UAE	Together We Move (لجر حن اعمر) (انغوبت جدم)	Ministry of Health and Prevention	Promotes physical activity among women of all ages using influencers, videos, posters and ads in various public spaces.

GCC, Gulf Cooperation Council; UAE, United Arab Emirates.

PA. However, there are few specific details regarding the amount of financial support to be provided. Examples of funding programmes aimed at promoting PA in the GCC include the Saudi Quality of Life Program 2020,⁴⁵ Oman's Vision 2040,⁴⁴ the Qatar Public Health Strategy⁴² and the National Policy for Prevention and Control of NCDs in Kuwait, the UAE and Bahrain.^{30,34,39} We could not find any evidence regarding the implementation status, specifically the degree to which the policies and their recommended actions are presently being executed. The trends observed in the evaluations are attributed to the implementation of policies, but no direct analysis has been undertaken. In the future, tools, such as PA-EPI or INTEGRATE-PA,^{45,46} which are currently being pilot tested, could be used to examine the implementation status of PA policies.

Evaluation

Various strategies have been implemented in the GCC states to evaluate PA policies. Saudi Arabia's National Diet and PA Strategy focuses on changes in PA rates and health indicators like obesity, while also monitoring policy implementation and effectiveness.²⁹ Oman has established a national monitoring system and emphasises both qualitative and quantitative evaluations in schools, with plans for future PA indicators.³¹ Qatar uses PA engagement rates as a key indicator and has developed a public health evaluation framework for its PA programmes.⁴² Kuwait's policy includes the STEP 2 indicator to measure

behavioural changes, along with evaluations for youth and sports programmes.⁴⁴ The UAE conducts annual evaluations of its NCD and PA policies with the WHO,³⁰ and Bahrain relies on regular surveys and assessments to evaluate its PA policies, including student fitness levels.³⁰ Table 5 provides more details on these evaluation components across the Gulf countries, offering further insights into the specific measures and frameworks used by each nation.

To assess the outcomes of PA policies, it is important to determine their degree of implementation. According to the policy documents from the GCC countries, there are specific performance indicators managed within the Ministries of Health and Sports to assess implementation.^{29-31,34,39,42} On reviewing policy documents related to PA interventions in the GCC, we found that none of them provide evidence of economic evaluations. This highlights a significant gap in assessing the cost-effectiveness of these interventions.

DISCUSSION

We conducted a desk-based comparative analysis of PA policies across the six GCC countries by examining the entire policy cycle. Our findings offer an initial understanding of the prevailing landscape of PA policies and the spectrum of potential strategies influencing policy formulation within the Gulf region. Regarding policy-making structures, the Gulf nations share common



Table 5 Evaluation components in the Gulf states

Country	Evaluation components
Bahrain	The National Action Plan for the control and prevention of NCDs and the National Strategy for Diet and Physical Activity rely on the Chronic Diseases Health Survey for evaluation. The Detailed Strategic Plan for Youth and Sport includes surveys and impact assessments, while the Teacher's Guide for Physical Education assesses PA levels among students.
Kuwait	The national policy for the prevention and control of NCDs includes an indicator called STEP 2, which evaluates behavioural and risk factor changes, such as increases in PA levels. The National Youth Policy and Physical Education Policy at schools have indicators and evaluation plans tracking curriculum integration, sports participation, and event organisation.
Oman	Oman has a national monitoring system to evaluate programmes promoting PA, with plans to develop new indicators. The Physical Education Standards Document emphasises qualitative and quantitative assessments of students' physical abilities in schools.
Qatar	Qatar has developed a framework for evaluating public health programmes, including PA policies, with specific standards for assessing fitness levels in school students.
Saudi Arabia	The National Diet and PA Strategy identifies changes in PA rates and public health indicators as key evaluation metrics. Other strategies, like the Obesity Control and Prevention Strategy and the Quality of Life 2030 sports initiatives, also track PA levels.
UAE	The national policy for NCD prevention includes annual evaluations with the WHO. The Physical and Health Education document integrates assessments to measure the impact of PA programmes on students.

NCD, non-communicable disease; PA, physical activity; UAE, United Arab Emirates.

political systems, mostly characterised by centralised governance. In general, health ministries in the Gulf region are the primary agency tasked with policies to enhance PA in the community. With all Gulf countries being members of the Gulf Health Council, the monitoring of PA for policy agenda-setting is consistent across all countries, which may improve the consistency and effectiveness of policy implementation. This unified approach ensures that data collection and evaluation methods are standardised, allowing for cohesive and comparable assessments of PA initiatives and their outcomes throughout the region. However, there are differences in leadership roles regarding policy formulation among these countries. In Oman and Saudi Arabia, the formulation of PA policies involves collaboration between the Ministries of Health, Sports and Education. Conversely, in Bahrain, Kuwait, Qatar and the UAE, this responsibility rests solely with the MoH. Generally, the identified policy documents outline formal partnerships between ministries within each country, but also reveal the existence of collaborations with the non-profit and private sectors.

A comparative examination indicates that decision-making primarily revolves around health and sports sectors, with the education sector following suit. While Oman, Qatar and Saudi Arabia have centralised policy documents guiding the promotion of PA, no such overarching policy document was identified in Bahrain, Kuwait or the UAE. Regarding policy implementation, there is a relatively comprehensive coverage for the main targeted groups in society, including women, but not for people living with disabilities and immigrants. This might be partially due to insufficient infrastructure for PA in the Gulf region, at least in the case of people with disabilities.⁴⁷

It is noteworthy that in the GCC countries, immigrants are not small minorities. In Qatar and the UAE, they account for nearly 90% of the population, and the average across all six GCC countries is 52%.⁴⁸ This underscores the importance of addressing the needs of immigrants, particularly given the lack of specific strategies to reach this significant demographic. A significant observation in this regard is the lack of information on funding designated for PA policies, with funding often sourced from health ministry budgets aimed at counteracting chronic disease. Lastly, we found that select PA policies have some evaluation in all six GCC countries, but we did not come across evidence of economic evaluation for these policies. However, nearly 43 000 people die each year in the GCC countries from the four major NCDs, accounting for 43% of all deaths in the region. Additionally, NCDs impose a significant economic burden, costing the economies of the GCC countries approximately US\$50 billion annually, equivalent to 3.3% of their 2019 GDP. Investment cases for NCD prevention in the GCC demonstrate that such efforts can yield substantial health and economic benefits. For instance, implementing model interventions could cost US\$14 billion over 15 years, increasing health expenditure by 1.4% annually or US\$16 per capita, while potentially averting 290 000 premature deaths and generating US\$49 billion in productivity gains.⁴⁹

Concerning the PA campaigns and initiatives in Gulf countries mentioned in table 4, the policy documents did not reveal thorough evaluation of these efforts. PA prevalence is a long-term outcome, and there is little information on more proximal measures of implementation.⁵⁰ Indicators, such as programme reach, policy enforcement and facility access, are crucial in this context. Programme reach measures the number of people



involved in policy-driven initiatives, policy enforcement evaluates the adoption and enforcement of relevant local regulations and facility access assesses the availability and usage of public spaces and facilities that promote PA.⁵⁰ Overall, the evaluation of PA policies requires more focus on process indicators to demonstrate how implementation may be improved given that Gulf countries continue to experience high rates of obesity and insufficient PA levels.^{17 51} Notably, Oman, Qatar and Saudi Arabia are further advanced in terms of their policy maturity and implementation efforts, showing better progress compared with other Gulf states.

PA policies in the GCC countries can be analysed through the lens of the four GAPP areas: Creating active societies, active environments, active people and active systems.¹⁵ Our analysis indicates that 'active societies' is moderately developed, with awareness campaigns and educational initiatives present in Oman, Qatar and Saudi Arabia.¹⁹ However, these efforts are less consistent in Bahrain, Kuwait and the UAE. 'Active environments' is the least developed area across all GCC countries, with insufficient infrastructure to support PA, particularly for people with disabilities and immigrants, as highlighted earlier.¹⁷ While some policies emphasise the development of public spaces for PA, implementation gaps persist, particularly in urban areas with significant immigrant populations.⁴⁸ As well, the hot climate and desert environments in large parts of the GCC mitigate against environmental change policies that promote PA. 'Active people' is partially addressed through community and school-based programmes, though there is limited inclusion of marginalised groups, such as immigrants and individuals with disabilities. Lastly, the development of 'active systems', involving policy integration, funding and evaluation, shows varied progress. Oman and Saudi Arabia have relatively advanced central policy frameworks and collaboration across ministries,²¹ while Bahrain, Kuwait and the UAE lack centralised policy documents and sufficient economic evaluations. This variation underscores the need for targeted strategies to strengthen weaker areas, such as active environments, while building on the progress made in fostering active societies and systems.

Our findings corroborate previous research conducted in the Gulf's two largest countries, Oman and Saudi Arabia. Albuljulaia *et al*²⁰ employed the Comprehensive Analysis of Policy on Physical Activity framework to evaluate PA policies in Saudi Arabia, while Al Siyabi *et al*¹⁹ used the IHEPA PAT tool for their analysis of Oman. Both studies highlighted the pivotal roles of health, sports and education ministries in shaping PA policies, as we observed across these and other Gulf countries. This consistency underscores the critical influence these ministries have in driving policy across the region, emphasising the need for coordinated efforts to enhance policy outcomes. Our study further confirms previous research²⁰ regarding funding allocated to PA policies. These allocations often are shared across initiatives aimed at enhancing quality of life and at addressing chronic diseases across all Gulf

states. However, the funding models make it challenging to disentangle the specific value of investments and directly link them to outcomes.⁴ Therefore, transparency is important for a more accurate evaluation of future PA policies. In addition, funding for PA policies typically originates solely from health ministries, indicating that a comprehensive, integrated government policy approach has not yet been fully realised.

Another noteworthy observation regarding policy formulation is the lack of policies and recommendations targeting the reduction of sedentary behaviour. Sedentary behaviour, distinct from physical inactivity, involves prolonged periods of sitting or low energy expenditure activities, which pose unique health risks.⁴ This observation is supported by research indicating that the study of sedentary behaviour remains relatively nascent in the region.^{52 53} By contrast, countries like Australia and Canada have formulated comprehensive policies and public health campaigns aimed at reducing sedentary time, particularly among children and adolescents.^{54 55} These examples highlight the potential for the Gulf countries to develop similar policies that address this emerging public health challenge.

Strengths and limitations

One of the strengths of this study lies in the comprehensive comparative analysis of 39 documents outlining policies aimed at enhancing PA across all six GCC countries, contrasting with previous research that primarily focused on individual countries in the Gulf region.^{19 20} Likewise, we searched for relevant documents from several different ministries, as opposed to other studies that only looked for PA policies from one or two ministries (usually health and/or education).^{20 56} Moreover, we obtained unpublished papers from the Ministries of Health and Education for Oman and Saudi Arabia, which were acquired through prior research involving interviews with policy-makers in both countries.²¹ This provides a holistic understanding of the approaches and strategies adopted by each country, thereby offering valuable insights for policy-makers, researchers, and practitioners in the field of public health and PA promotion.

In our study, we encountered some limitations. While we identified 39 documents for analysis, more documents may exist, but they might not be publicly available. As well, there may be additional stakeholders and policies in other sectors that were not captured in this study due to limited access to non-public documents. For instance, relevant sectors, such as urban planning, transport and tourism, might involve stakeholders whose contributions were not fully documented. Moreover, certain types of actors, such as local government agencies, subordinate bodies, like national public health institutes, and NGOs (eg, sports associations or organisations representing specific population subgroups, such as people with disabilities or immigrants), may play a role in PA promotion but might not have been fully captured in the accessible policy documents. Future research could aim to

include a broader range of stakeholders in the analysis. This may help national governments identify additional policy perspectives that are so far underrepresented in their PA policy-making processes. Furthermore, due to the unique governance structure of the UAE, where each of the seven emirates maintains distinct systems and laws, there is a possibility of undiscovered documents relevant to PA policies in these subregions. This warrants further investigation in the future, encompassing all seven emirates. Furthermore, the lack of implementation evidence means we do not know what resulted from these policy documents, particularly at the individual level and in terms of behavioural changes.

Due to the lack of response from policy-makers in Bahrain, Kuwait, Qatar and the UAE, we could not apply all questions of the HEPA-PAT. Instead, we used a subset of the HEPA PAT questions, identified by Gelius *et al*¹¹ as suitable for analysis by desk research. As such, further research might attempt to corroborate our results by obtaining expert feedback on the identified policies. However, as the methodology employed in this paper allows for at least a partial analysis of PA policy without having to rely on additional expert input, it could also serve as a reference for future researchers attempting to analyse PA policies in contexts where policy-makers are unresponsive or minimally engaged.

CONCLUSIONS

We conducted a comparative analysis of PA policies across GCC countries, shedding light on their formulation, implementation and evaluation processes. Our findings reveal a complex landscape of PA policies within the region, characterised by commonalities and disparities. A key finding is that the centralised government system in most GCC countries provides an opportunity for cross-sectoral policy development and implementation.

While collaboration among Ministries of Health, Sports and Education is evident in some countries, like Oman and Saudi Arabia, others rely solely on the MoH for policy formulation. This lack of formal cross-sector collaboration might limit the effectiveness of PA policies, as joint efforts often provide more comprehensive solutions.⁵⁷ In addition, the lack of policies targeting sedentary behaviour, as well as certain relevant population subgroups, represents a significant gap, missing a crucial opportunity to address its unique health risks. Effective PA policies must incorporate sedentary behaviour reduction strategies and ensure these are evaluated for their impact on public health outcomes in the Gulf states. Therefore, effective PA policies in the Gulf states require robust process evaluation and the ability to clearly link implementation efforts to tangible outcomes.

Overall, our study provides valuable insights into the landscape of PA policies in the Gulf region, highlighting areas for improvement and serving as a reference for future researchers grappling with similar challenges in policy analysis. Enhancing transparency, inclusivity and

evaluation mechanisms are essential for fostering effective PA policies to combat insufficient activity levels and rising rates of obesity in the Gulf region.

Contributors AAA conceptualised the study, searched for and analysed the policy documents and prepared and drafted the original manuscript. PG, AG, AB and KG helped with the conceptualisation and validation of the study and provided writing review and editing, supervision and administration. AAA and KG responded to the editors and peer reviewers during the submission process and they are responsible for the overall content as guarantors. All authors approved the final version of the manuscript to be published.

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Ethics approval For this study, we analysed publicly accessible documents from government websites across all six countries of the Gulf Cooperation Council. We did not collect personal, sensitive or confidential information. Therefore, ethics approval was not required.

Provenance and peer review Not commissioned; externally peer reviewed.

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CHAPTER

6

6 STUDY 3

Understanding physical activity in the southern region of Saudi Arabia

6.1 Overview

This chapter includes an in-depth study on understanding physical activity in the southern region of Saudi Arabia, exploring the various challenges faced by individuals and communities in adopting and maintaining an active lifestyle.

6.2 Study 3: Understanding physical activity in the southern region of Saudi Arabia

Abstract

Background: Physical activity (PA) is essential for health and chronic disease prevention, yet participation rates in Saudi Arabia are among the lowest in the world. While the southern region of southern Saudi Arabia has a cooler climate and a natural environment, conducive to activity, rates are lower than in the rest of the country. This region presents unique cultural, social, and environmental challenges that shape individuals' physical activity.

Objective: We explored how adults residing in the Southern Region account for their decisions and experience of their physical activity.

Methods: A qualitative study was conducted using semi-structured interviews with 15 participants from diverse backgrounds in the region. Questions were generated from different levels of the social-ecological model (SEM). Data were analysed inductively to develop themes explaining participants' physical activity experiences.

Results: Two overarching themes were generated: 'Release with Restrictions' and 'Physical activity as Investment'. Participants described physical activity as a form of physical and mental release, though opportunities for enactment were often restricted by safety concerns, social norms, and competing priorities. Gender-specific barriers were evident, with women facing higher financial costs, limited access to facilities, and heightened cultural expectations. Environmental factors, such as inadequate infrastructure and safety risks, further restricted Physical activity. Participants also viewed Physical

activity as an investment in health, motivated by acute benefits, such as stress relief, and long-term gains, including disease prevention. Decisions about the type and frequency of Physical activity were somewhat governed by the perceived “return on investment” in terms of time, money and opportunity costs.

Conclusions: Government efforts have shifted cultural norms and improved infrastructure for PA, creating a more Physical activity conducive environment. However, persistent gender inequities and uneven benefits highlight the need for inclusive policies and campaigns that normalise diverse Physical activity options, particularly for women, and promote active travel as a viable choice.

Keywords:

Physical activity, socio-ecological factors, Saudi Arabia, qualitative research

Background

Physical inactivity and sedentary behaviour are primary contributors to non-communicable disease (NCD) risk (Dishman et al. 2022), accounting for approximately one-tenth of global deaths (World Health Organization). While insufficient Physical activity is a global issue, the Middle East and Gulf region exhibit particularly high rates. For example, in 2018, 84% of adolescents in Saudi Arabia were not sufficiently physically active (Guthold et al., 2020). Among adults, 45% of men and 65% of women were classified as insufficiently active (Strain et al., 2024). However, most research on the what shapes people’s PA has been conducted in Western countries (Ramírez Varela et al. 2021) and sociocultural and geographic contexts vary between countries and play a crucial role in driving participation in Physical activity, warranting context-specific research (Bauman et al. 2012).

Among the small number of studies conducted in Saudi Arabia, the hot climate, desert environment and lack of time were factors hindering Physical activity (Samara et al. 2015; Abdel-Salam and Abdel-Khalek 2016; Almajwal 2015; Albujujaya and Stevinson 2023; Alobaid, Syed, and Al-Rawi 2023). However,

these studies were conducted in in the centre, west, and north of the country. While these regions, and most of Saudi Arabia, are dominated by desert and a hot climate (often exceeding 45°C), the southern region, with a population of six million people (General Authority for Statistics), is characterised by diverse terrain, including mountains and coast, as well as a much cooler climate (20°C to 30°C) (Abdullah and Al-Mazroui 1998). This region is suitable for hiking, rock climbing, and mountain biking - activities not usually possible in other parts of the country. Surprisingly, despite the more supportive climate and physical environment, rates of physical inactivity in the southern region are higher compared to the rest of the country (72.5% vs 70.3%) (Saudi Authority of Statistics 2021).

One quantitative study investigated Physical activity among university students in the southern region and found lack of time and the absence of accessible and suitable sports facilities as the most common barriers to PHYSICAL ACTIVITY (Awadalla et al. 2014). The quantitative approach meant that responses were limited to those provided in the survey, and the contextual factors and sociocultural aspects informing those barriers were not captured. To date, no qualitative studies have examined the perspectives of the general population regarding physical activity in Saudi Arabia.

Our qualitative study explores residents of the southern region of Saudi Arabia's accounts of the types and aspects of activity that appeal to them, decision making around being active and opinions on what would help or hinder them in achieving their activity goals.

Methods

Study design

We conducted a qualitative study using semi-structured interviews with adults from February to May 2024. The study received approval from the Human Research Ethics Committee of the University of Technology Sydney (UTS HREC REF NO. ETH22-7510) and the Ministry of Health in Saudi Arabia.

Site selection

Recruitment took place through primary healthcare centres. There are 600 primary healthcare centres in southern Saudi Arabia, with 50 designated as on-duty centres. These centres varied in operating hours (double shifts or 24 hours), location (urban vs rural), and area-level socioeconomic status (low, medium, high), ensuring comprehensive coverage of healthcare services across varying socioeconomic need (Ministry of Health). We targeted these on-duty centres specifically as they are frequented by individuals from all layers of the community and have high patient numbers. All 50 on-duty healthcare centres were included in the population to ensure a spread of locations in the sample.

Participant recruitment and consent

We approached General Practitioners (GPs) at the on-duty centres to recruit participants, as people generally trust GPs (Aljaffary et al. 2021), increasing the likelihood of finding potential interviewees.

We emailed electronic flyers with an information sheet to GPs in all 50 on-duty healthcare centres through the Administration of Scientific Research in Health Affairs in the southern region. The flyers covered study objectives and requirements and the lead researcher's contact details. GPs who did not respond within one week were recontacted. If there was still no response after another week, the lead researcher made contact via mobile phone (number obtained through Health Affairs). Once a GP agreed to be part of the study, they recruited from among their patients over an 8-week period by verbally explaining the study and its objectives. If patients agreed to participate, their GP notified the lead researcher, who subsequently contacted the patients directly and e-mailed a participant information sheet and consent form. At the beginning of the interview, participants were informed that they could withdraw from the study at any time and their participation was entirely voluntary.

Inclusion and exclusion criteria

The study included adults aged 18 years and older who had resided in the region for at least one year to ensure familiarity with the area. Individuals with pre-existing health conditions or circumstances that

might significantly impact their ability to engage in Physical activity were excluded. The final decision to select suitable participants was made by the GPs.

Participant sampling

Sampling was purposive, using a maximum variation approach to ensure a diverse range of participants in terms of gender, income, urban/rural, age and education. Previous research has shown that people's capacity to access and engage in physical activity can vary based on these attributes (Bauman et al. 2012; Alobaid, Syed, and Al-Rawi 2023). The final sample size (15 participants) was determined by data saturation, the point at which no new information emerged (Saunders et al. 2018), after which recruitment ceased (Perera et al. 2022).

Data collection and management

Semi-structured one-on-one interviews were conducted in Arabic via video conference (Zoom) by the lead author who is a native Arabic speaker. The interview guide (Appendix 1) was informed by the SEM (Sallis, Owen, and Fisher 2015) and qualitative studies that explored factors hindering or promoting Physical activity (Boutevillain et al. 2017; van Rijen and Ten Hoor 2023). The discussion guide probed social, cultural, and environmental dimensions to get a broad spread of factors which might interact and influence Physical activity levels. The interviews were audio-recorded using a Zoom account. Recordings were transcribed verbatim to English by Sonix (a program for transcribing and translating from Arabic to English) and checked for accuracy by the lead author (Sonix 2024). Participants were offered -to check their transcripts for accuracy but availed themselves of this. Data were anonymised and a unique non-identifying code was applied to each transcript which were then imported into NVivo version 14.0d (Lumivero 2023). Identifying comments (names or locations) were disguised to preserve anonymity.

Data analysis

The analysis was conducted by the lead author, a medical doctor at King Faisal Medical City in the southern region, under the guidance of his three supervisors. The lead author had conducted interviews

and qualitative analysis for a previous study (Alzahrani et al. 2024) and is interested in Physical activity and the prevention of chronic diseases.

Inductive thematic analysis was used, characterised as a technique for identifying, analysing, and elucidating patterns and themes within the collected data without preconceived ideas or theories (Braun and Clarke 2006). We followed the analytic phases outlined by Clarke and colleagues (Clarke, Braun, and Hayfield 2015). After transcribing the interviews, the principal author familiarised himself with the data by reading and rereading the transcripts. Next, codes were generated inductively, identifying meaning in relation to the overarching research aims, and applied to a small number of transcripts (n=4). The codes and coding were reviewed by one supervisor to clarify content and interpretation. The lead author modified the coding frame to incorporate new or adjusted content and applied them across the dataset, with iterative consultation with the supervisors on codes and their application and interpretation. Candidate themes were generated iteratively through the retrieval of code content across the dataset and consultation with the supervisors. Themes were revised and defined to eliminate overlapping or weak themes. The final themes were selected by the research team for their adequacy in explaining the interviewees' accounts of their PA.

Results

Sample description

Fifteen participants of diverse ages (24 to 63 years) and backgrounds in terms of marital status, employment and education were interviewed for this study, including five women (Table 1). Participants P5 and P10 were notable for their active involvement in government campaigns promoting Physical activity in the southern region.

Table 1 Demographic characteristics of the participants

Participant	Age	Gender	Marital status	Education	other

P1	24	Male	Single	Higher Education	Employed
P2F	29	Female	Single	Higher Education	Employed
P3	48	Male	Married	Higher Education	Employed
P4	63	Male	Married	Secondary Education	Unemployed
P5	60	Male	Married	Intermediate Education	Unemployed
P6	52	Male	Married	Secondary Education	Unemployed
P7	24	Male	Single	Higher Education	Student
P8	34	Male	Married	Higher Education	Employed
P9	23	Male	Single	Higher Education	Unemployed
P10F	52	Female	Married	Secondary Education	Employed
P11	25	Male	Single	Higher Education	Student
P12F	45	Female	Married	Secondary Education	Employed
P13F	34	Female	Married	Secondary Education	Employed
P14	33	Male	Married	Higher Education	Unemployed
P15F	30	Female	Married	Higher Education	Unemployed

Thematic analysis

Two overarching themes were generated through our analysis of our interviewees' accounts of their Physical activity experiences which explained how they conceptualised Physical activity and what shaped their participation. The first theme was called Release with Restrictions and captures the apparently liberating aspects of Physical activity both mentally and physically, which is limited by concerns such as safety, as seen in the subtheme Physical activity as Unsafe. The second theme Physical activity as Investment highlights a strategic approach to decision making about the performance of Physical activity where participants assess the time, effort, and resources (including money) invested against the benefits gained. Together, these themes reveal a dynamic interplay of motivation and

constraint in participants' engagement with physical activity, where in the context the will to realise the acute and long-term benefits of physical activity is held in tension with broader systemic forces such as culture and environment.

Release with restrictions

This theme describes how participants experience physical activity as a source of relief and freedom that provides a sense of physical and mental release, but is juxtaposed by social expectations, cultural norms, or environmental features.

Physical activity as a physical and mental release

Participants described physical activity as a powerful form of both physical and mental release, with individuals expressing the varied ways it helped them cope with life's demands. For some, it was a physical release, where physical activity offered a sense of physical freedom that allowed them to break from the intensity of daily routines. For example, some participants associated physical activity with the sensation of releasing built-up tension.

“The positive impact, I mean, the impact that sport leaves when you practice it and when you get tired and sweat comes out of you and you exert muscular effort, all of these are a release of tension, discharge of charges, removal of toxins from the body.”

[P3]

Others found that physical activity helps release energy, leaving them feeling revitalised and physically refreshed.

“I feel like I have new energy. A sense of refreshment. If I take up any other task, I can accomplish it.”

[P13]

Beyond the physical benefits, many participants described physical activity as a means to mentally disconnect from their concerns. Activities like walking allowed them to clear their minds, tackle personal challenges, and process thoughts without distraction.

One female participant described this experience as especially helpful when trying to sort through particular problems:

“Sometimes, when facing an issue or problem, walking in cloudy weather helps clear your thoughts without pressure. Walking makes you think more broadly and precisely.”

[P10 F]

For some participants, Physical activity served as a vital outlet for managing complex emotions, offering a way to process stress through movement. One participant shared that exercise reduced pressure allowing her to cope with negative experiences.

“It’s a way to cope with emotional stress—whether it’s a bad experience with a friend or partner. Exercise reduces psychological pressure. It’s like a positive outlet.”

[P2 F]

The physical environments where physical activity took place also contributed to this sense of release. Participants often described locations like the Corniche (the waterfront), with its open spaces and sea views, as uplifting and conducive to relaxation.

“From a philosophical perspective, we consider the colour blue, such as the sea and the sky, to be uplifting and mood-enhancing. This is something that makes the soul feel open and relaxed. It’s

beautiful when a person goes out and sees a wide expanse of sight, and this plays a very significant psychological role.”

[P1]

Similarly, another participant recounted how a simple half-hour walk relieved stress at home and improved their mood, despite returning to a tense household environment. By providing mental space and clarity, physical activity became a practice of emotional regulation, enabling participants to approach situations with greater calm and perspective.

“Today I came home after just a half-hour walk, the house was stressful, and my wife was upset, but I was very calm thanks to the walk. It allowed me to control my nerves, especially since fluctuating blood sugar levels can make nerves fray easily.”

[P6]

Within a similar vein, other participants found that physical activity allowed them to reframe their day and view life with renewed optimism and empathy even whilst they were engaging in physical activity.

“Escaping psychological stress and structured thinking leads to a natural life filled with love, and you start seeing the world differently as you walk, feeling people’s emotions and exchanging smiles and love, elevating and enriching life.”

[P6]

In summary, Physical activity served as both a physical and mental release for participants, helping them cope with and manage daily life challenges positively. For some, it was a means of releasing bodily tension and break from routine. For others it offered a mental sanctuary, allowing them to process

emotions, gain clarity, and find calm. The settings in which physical activity occurred, such as open, scenic environments, enhanced these effects.

Physical activity participation is restricted

In contrast to the conceptualisation of physical activity as a form of physical and mental release, our interviewees often described their attempts to engage in physical activity as bounded. Two subthemes of restriction were generated: 1. Obligations to Work and Family and 2. Physical activity as Unsafe

Obligations to Work and Family

Participants frequently described how they felt various obligations limited their ability to engage in physical activity, with work and family responsibilities being the most common. These were often described in terms of unproblematised priorities or imperatives, where the other activities as being fixed and physical activity as fitting in after they were discharged.

“Definitely, my work in the morning or afternoon sometimes affects whether I can walk in the afternoon or have to postpone it to the night, or possibly not walk at all due to work pressure.”

[P8]

“Work takes about eight hours of your day, and you need eight hours of sleep. So, you're limited. Sixteen hours are gone from your day. You have limited time left, but if you have determination and perseverance, you can train.”

[P14]

As conveyed in the quote above, the task of overcoming these systemic obstacles is often devolved to the individual.

“If the work or the thing that prevents me from physical activity can be done by someone else, for example, one of my brothers and he is close, I can send him instead of me.”

[P3]

Family obligations also played a significant role in shaping participants’ physical activity routines. As with work, participants positioned these as non-negotiable in that they were the tasks to be satisfied first and physical activity would need to fit around this.

“Of course, I’m a family man and have four children at different stages of education, I have a wife, I have a house, I have commitments, I have obligations, I have work, these responsibilities can ... sometimes pull one slightly away from their path.”

[P3]

“For one female participant work and family together impacted her physical activity.

Work and the work schedule, I mean, and the family, I mean, they need time, I barely find time to practice this sport.”

[P12 F]

These examples reveal the enjoyment and benefits of physical activity were in tension with family and work, which were often positioned as superordinate. While physical activity provided moments of release and even delight, achieving adequate levels of activity was framed as a personal task that had to be managed within the constraints of these overarching responsibilities.

Physical activity as unsafe

Restriction of being active and choice of activity also stemmed from safety concerns, not only from the physical risks posed by infrastructure and environmental conditions, but also from social risks related to cultural expectations and fear of judgment. People's descriptions of their decision making for physical activity were sometimes framed in terms of managing or mitigating these perceived threats, whether they involved physical harm or social disapproval.

Physical safety

For many participants, physical safety was a significant factor shaping their physical activity. Descriptions of perceived threats to personal safety were vivid and detailed, sometimes highlighting specific elements of the built environment that hindered participation. These concerns ranged from poorly designed infrastructure, such as narrow sidewalks and inadequate pathways, to a lack of proper lighting that made certain areas feel dangerous, especially at night.

“The road to the walking path has uneven parts, so I can't go to the designated walking path on foot, only by car...”

[P12 F]

“I hope they don't allow cyclists because it has become dangerous. Both motorcycles and bicycles are dangerous, and there have been fatalities because the roads are unsuitable.”

[P5]

“In the dark, there could be potholes, and you can't see the road due to the lack of sidewalks and paths.”

[P9]

According to our interviewees, streets designed more for vehicles than people posed a danger for physical activity. Moreover, some interviewees felt there is a culture of driving, further marginalising active travel.

“Our society isn’t accustomed to walking. When I travelled to the United States, I realised I could walk huge distances, like eleven or twelve kilometres, without noticing. The need also confines us. We don't feel the need to walk because we have cars.”

[P6]

Through the decision-making process, whether walking, jogging, or cycling, participants weighed the potential risks against the benefits, and for many, the perceived threats to their physical safety often tipped the balance, discouraging them from engaging in regular physical activity.

Social safety

There were not only concerns for physical safety, but also for social safety. Cultural norms shaped how individuals approached physical activity, guided by a keen awareness of potential social sanctions.

Whether it was the type of activity, the clothing worn, the location or the public visibility of the exercise, several interviewees were cognisant of drawing negative attention or disapproval from others.

“In terms of safety, there is no issue, but other problems, you know, walking at twelve midnight and such. It's not socially acceptable for a girl or woman to be out alone at night....”

[P12 F]

“I can walk in a mall without anyone questioning me as if I’m shopping, although there’s a different perception there. For me, when I walk in the market, people look at me as if I am a sugar daddy.”

[P6]

One woman described how social disapproval explained why she didn’t walk in her neighbourhood and instead drove to a designated walking path.

“Well, someone might say, 'Why are you here in front of our house and why do you always walk past our house?' These are obstacles.”

[P13 F]

Another respondent spoke defiantly about how he felt about potential social sanctions, but in the end was still conscious that what he was doing was somehow breaching a social norm.

“I don’t know. For me, as I told you, I defy the norms. I walk differently and don’t think about the reactions that come from how people look or what they say. Sometimes you get a clear look that affects you, but I don’t dwell on it, though it does make me sensitive.”

[P6]

Certain forms of physical activity, particularly those performed in public or mixed-gender spaces, were perceived as more likely to invite criticism or judgment. This concern was especially evident among women interviewees, who spoke of the social pressure to adhere to traditional roles and behaviours, with physical activity sometimes seen as conflicting with these expectations.

“You see, where I come from, it’s a bit conservative. There are parts of my body that I cannot show in public. However, in a closed gym where it’s all women, I can easily do exercises like back workouts, muscle exercises, and glute exercises. It’s much harder to do these things on walking paths due to societal norms or, I mean, the prevailing mindset in our community.”

[P2 F]

“Firstly, cycling because women are supposed to be modest and not show certain parts in front of men. Regarding swimming, the same issue applies; the beaches have modestly dressed people, so a woman can't swim unless she does so modestly.”

[P15 F]

Men were also aware of these norms.

“Doing housework or being tied to her children or her husband is not acceptable, but the view of physical activity in society has begun to improve, but there is difficulty for a woman to go out for physical activity daily.”

[P8]

Some appeared to not see such restrictions as problematic.

“...we are in a village that preserves customs and traditions. And I don't expect, I mean, women to appear on the paths, and those who want to walk can walk in her home or in a large place in the house, but I haven't seen any women on the walking paths.”

Notably, men did not describe as many social limitations and could freely use public spaces. Restriction of physical activity came from a number of sources, whether as in competition with other demands on time or poor infrastructure, traffic, and cultural expectations. In this way, the notion of physical activity as a mechanism for individuals feeling free was often tempered by wider systemic limitations.

Physical activity as investment

The second major way physical activity was seen as an investment, was in terms of time, money, and effort. Government investment also was raised in terms of creating supportive environments such as safe walking paths and sports facilities. Thinking about physical activity as an investment was evident both in general perceptions about the value of physical activity as well as decision making about particular episodes of physical activity.

Investment in health

Participants viewed physical activity not only as a source of immediate and tangible benefits as shown in the previous section (Physical activity as a Release), but also as a long-term investment in future health with the dual rewards of disease prevention and overall well-being.

“The primary objective is overall health. Walking and sports help reduce the risk of diabetes, blood pressure issues, mental stress, and cancer, God forbid.”

“Well, my goal is to have a body that helps me in any sport I need and to have a healthy body that, God willing, keeps me away from diseases and becomes a way of life.”

[P7]

One participant emphasised the invaluable nature of health, suggesting that it is the foundation of a fulfilling life, and once lost, everything else loses its value.

“Health is a crown on the heads of the healthy. If you lose your health, you have nothing left in this world.”

[P14]

Another male participant noted that physical activity played a key role in managing his chronic condition and significantly enhanced his quality of life.

“I also noticed that walking helps regulate my blood sugar levels, especially the long-term blood sugar.”

[P6]

In summary, participants framed physical activity not only as a short-term source of relief, but as a long-term investment in health to prevent or manage chronic conditions and enhancing overall function. For some, this proactive approach to health served as a powerful motivator, reinforcing their commitment to being active.

Return on investment (ROI)

Another means by which physical activity was conceived as an investment was where effort, time, and resources were balanced against the benefits gained. That is, was there a sufficient return on investment (ROI)? ROI influenced daily exercise decisions, the types of activities chosen, and long-term commitments. Hence, while participants valued the long-term health benefits of physical activity, short-term decision making turned on what offered the greatest return.

One man captured the concept of ROI, explaining how his choices around physical activity are driven by the trade-off between effort and benefits.

“Let's take a specific sport, for example, football. Booking a specific field with friends might be restricted to a schedule that doesn't align with mine. For example, a field far from my location and at a high price. Among the things that made me distance myself from football is the need for a large team and coordination with several individuals in advance.”

[P1]

For women, there seemed to be added costs both literally and in terms of effort which affected calculations of the ROI. In both cases below, walking becomes the physical activity of choice because of the expense and effort required for other forms of physical activity.

“As for the gym, it's also encouraging, as I need to go there, dress appropriately, and allocate time. In contrast, walking outdoors doesn't require any special preparation—you can simply walk on these designated paths. Overall, it's a positive experience. For swimming, it's similar at the gym with a private trainer.”

[P2 F]

“The first reason is the cost of gym memberships. The prices are very exaggerated. When I go to the gym, I personally like to have a personal trainer to teach me how to use the machines properly, and this service is not available in the gym, especially in the southern region. You have to pay extra fees on top of the high membership cost to get a personal trainer to pay attention to you, so walking is honestly the easiest and simplest thing I can do without needing anyone's help or going to a specific place.”

[P12 F]

This interviewee also noted the cost of not being able to show her face, which meant that she chose sites away from the well-frequented designated walking paths.

“For me, I prefer walking in residential areas empty of residents, away from people, away from sight. I can uncover my face and breathe well. “

[P12 F]

Participants' assessment on ROI not only considered costs but also benefits beyond physical health outcomes such as improved social interactions, mental well-being, and enjoyment.

“When you have a friend on the road and you and him practice the same sport and the same common interest. So, I see that it means something positive. Something motivating.”

[P3]

“Honestly, one of the things that motivates me to be active is choosing the right friends and organising social gatherings from time to time to discuss sports topics.”

[P1]

One female participant highlighted that a key co-benefit of physical activity is the opportunity to strengthen social connections within the family, enhancing the investment in time and effort.

“There's harmony, even within the family itself when they walk together, and among the neighbours, the way they interact changes. Work stress and tension decrease. When you're together like that, everything changes for the better.”

[P10 F]

Ultimately, the perceived ROI shaped participants' physical activity choices, favouring activities that provided valued co-benefits, such as social interaction, and which were reasonable in terms of cost and convenience. Walking, in particular, was seen by many as offering a high ROI due to its accessibility, low cost, and immediate physical and mental benefits. However, not all participants prioritised social aspects, and some sought alternatives that could deliver similar returns with less investment of time, money, or effort. Notably, the “cost” of engaging in physical activity was often higher for women, who faced both higher fees for the same services and additional cultural expectations.

Government investment in physical activity

The final dimension where physical activity was conceptualised as an investment was where participants discussed the role of government in promoting physical activity through investments in infrastructure such as parks, walking paths, sports facilities and social marketing campaigns. Many acknowledged the positive impact of these initiatives, noting a recent acceleration in investment that has further encouraged active lifestyles and expanded access to facilities and recreational spaces.

“We often see that the state has supported sports projects and supported sports awareness within the Kingdom of Saudi Arabia, which has led to changing people's ideas and raising their health awareness.”

[P1]

“Compared to ten years ago, there were no good fields for people, but now, thankfully, the state provides everything, whether fields, clubs, walking paths, or parks. All are available and help people engage in sports.”

[P13 F]

One female participant noted that Saudi Arabia's Vision 2030 (Saudi Vision 2030) has played a pivotal role in enhancing health and encouraging greater participation in physical activity, especially for women. Other participants specified the government's role in investing in the construction of facilities to promote PA.

“Well, sports fields have become available, even in the villages, I mean, a slightly remote village has a sports field, a volleyball court, and a planted football field. Add to that a walking path and parks in the villages behind my village. Also, the state's provision of media broadcasting. The media also encourages. Schools. They encourage. People's view is positive.”

[P3]

However, some interviewees also noted where they felt government efforts fell short, saying while new facilities exist, they are not always well-maintained or evenly distributed across communities, especially in the Southern region.

“Soccer fields in the southern region are significantly inferior in terms of surface quality, location, services, and prices. Gyms also lack equipment quantity and quality compared to those in the central, western, and eastern regions.”

[P11]

“Honestly. You can count the number of women's gyms in the southern region on one hand compared to other regions. Other areas have more competition between gyms, more offers, and more varied and modern sports equipment, which we don't find in the southern region.”

[P 12 F]

“Outside the gym, the options are limited, whether in terms of location or the length of the tracks. Some places are longer, but they are public parks and can get crowded, which can be distracting.”

[P9]

Others felt that awareness campaigns lacked continuity and did not reach all segments of society, limiting their effectiveness in changing long-term behaviour.

“I believe their impact is limited and targets specific groups, like the elderly. They publish certain posts that are trivial or not engaging, like "exercise for your health". I already know it's for my health; I don't need a reminder. I don't see any real impact from these campaigns.”

[P14]

Overall, this subtheme captures a dual perspective: participants generally supported a role for government in promoting PA, with many expressing appreciation for investments in infrastructure and social campaigns both personally and perceived benefit for the broader community. However, there seemed to be some doubt cast on equity and the real impact of government investment in physical activity.

In summary, physical activity as Investment reflects how participants view physical activity as a strategic investment in their health, time, and resources. They weigh the benefits, including personal health and social connections, when selecting a physical activity. Government investment provides part of the environmental backdrop for individual choices, providing social marketing and infrastructure, the effectiveness of which was in dispute in our sample.

Discussion

This is the first qualitative study exploring physical activity among residents in the southern region of Saudi Arabia. Drawing on the SEM to interpret these findings, it is evident that both personal and systemic factors inform the engagement in physical activity in this region (Sallis, Owen, and Fisher 2015). We generated two key themes, namely Release with Restrictions, and physical activity as Investment, which showed physical activity was well understood as having immediate and long-term health benefits, but its enactment was subject to systemic barriers and inequities which foreclosed on some opportunities and rendered others less attractive. In weighing costs (literal and metaphorical) against returns, due to the conservative culture of the region women seemed to have more complex calculations.

Walking often emerged as the physical activity of choice as it not only provided health dividends, but co-benefits as it could be done with other people or alone if desired. The costs are low and government investment in infrastructure meant there were safe options for men and women, and for the latter it is a socially accepted form of exercise. However, the insufficient supply of designated paths was criticised. Given the dominating car culture and the time cost associated with traveling to designated walking areas, further investment in walking infrastructure is crucial. Prioritising increased neighbourhood walkability not only could reduce the reliance on cars and make active travel more accessible but the social acceptability of engaging in such activities within the community could also increase. A study conducted in Hong Kong examined how improvements in the walking environment can lead to shifts from car usage

to active travel modes, such as walking and cycling, contributing to a cultural shift towards more sustainable transportation habits (Chan et al. 2022). Consistent with the SEM (Sallis, Owen, and Fisher 2015), supportive physical environments at the community level encourage physical activity by lowering logistical and social barriers (Høyer-Kruse et al. 2024).

Our findings also emphasise the need for diversity in physical activity options. While walking was preferred by many, others expressed a desire for activities that offered co-benefits such as social interaction or enjoyment. Environments which cater to a range of needs and go beyond physical fitness to deliver social and emotional benefits as reflected in participants' experiences are required (Sallis et al. 2015; Vella et al. 2023). For example, the global phenomenon Parkrun owes much of its popularity to combining PA with social interaction amongst participants (Wiltshire and Stevinson 2018; Stevens, Rees, and Polman 2019). Additionally, emotional benefits, such as stress relief and improved mood, have spurred engagement, as seen in community-based walking groups where participants reported enhanced well-being and greater motivation to stay active (Hogan et al. 2015).

Government efforts in physical activity -friendly policy and infrastructure development, including inclusive social campaigns, seem to have played a role in shifting cultural norms around physical activity in the Southern region of Saudi Arabia. Participants attributed these changes to government initiatives, which appear to align with the SEM's emphasis on policy-level interventions that influence individual behaviours (Al-Hazzaa and AlMarzooqi 2018). The evolving cultural landscape, particularly in Southern Saudi Arabia, demonstrates a loosening of conservative attitudes, fostering greater freedom in physical activity choices across genders and generations. These government-led changes have expanded the range of acceptable and accessible physical activity options, aligning with the themes of Release with Restrictions and physical activity as Investment by addressing systemic barriers and creating a more supportive environment for active lifestyles. Our study demonstrates that the Saudi government has played a pivotal role in driving these cultural and infrastructural changes by making physical activity initiatives and programs accessible to both genders and various age groups, paving the way for broader participation in physical activity (Alzahrani et al. 2024).

Persistent systemic inequities continue to affect the ROI for women. For example, while gender-segregated spaces provide a level of social safety for women, gym membership costs are often significantly higher for women than for men, limiting their freedom of choice. Addressing this inequity may require policy changes such as implementing regulations to prevent gender-based pricing disparities, ensuring fair and equal access to facilities. For instance, in the United States, laws like California's Gender Tax Repeal Act of 1995 prohibit businesses from charging different prices based on gender to prevent discriminatory pricing (California Legislative Information 1995). Our study highlights how social representations of masculine and feminine sports among Saudi adolescents contribute to gender disparities in physical activity engagement. These representations reinforce cultural expectations that limit women's access to diverse physical activity opportunities (Alsamih 2024). This inequity, which adds to the “cost” of PA for women, reflects institutional barriers that need addressing for truly inclusive physical activity promotion.

While participants generally welcomed the improvements in physical activity infrastructure, they expressed mixed feelings about physical activity campaigns. These campaigns are often aimed at individuals without addressing the broader systemic challenges that people encounter when trying to engage in physical activity (Bauman et al. 2012). For instance, our data showed that while campaigns encourage physical activity, impediments, such as higher costs for women, cultural expectations, limited safe infrastructure for activities like cycling, and the normalisation of prioritising other demands, such as work, and family, persist. This disconnect indicates a need for campaigns that target individual behaviour but also advocate for systemic change (World Health Organization 2022). By addressing barriers at the policy and community levels, campaigns could resonate more effectively with the population and support lasting change (Albujulaya, Stevinson, and Piggin 2023).

Participants cited competing priorities, such as work and family obligations, as major barriers to regular physical activity. As in other studies (Deslippe et al. 2023), habit formation and intentional planning were personal strategies to temper these constraints. These solutions align with the SEM's individual level but highlight the limitations of relying solely on personal strategies to overcome systemic barriers

(Kwasnicka et al. 2016). Additionally, working hours intersect with the need for supportive infrastructure and policies that accommodate active lifestyles. For instance, infrastructure supporting active travel to work or the provision of physical activity facilities within or near workplaces could alleviate some of these barriers. Policies, such as flexible working arrangements or working from home, could also help free up time for individuals to engage in physical activity. For example, research found that working from home increased sedentary behaviour (e.g., screen time, sitting) but also boosted domestic physical activity (de Oliveira da Silva Scaranni et al. 2023). These measures would shift some responsibility from individuals to systemic solutions, better aligning with the SEM's emphasis on multi-level interventions.

In light of the findings, key recommendations emerge. Developing community sports facilities, separated cycleways, and outdoor gyms, as recommended by the Centers for Disease Control and Prevention, could provide varied options that cater to different interests and needs, ensuring that individuals have more opportunities to engage in physical activity that suit their preferences (Centers for Disease Control and Prevention 2024). Additionally, integrating cultural and religious values into physical activity programs, such as gender-specific programs like providing female-only exercise spaces, could make them more acceptable and appealing to the target population, fostering greater engagement, as suggested by two studies from the Middle East (Sharara et al. 2018; Aljayyousi et al. 2019). Moreover, more inclusive campaigns should also address systemic barriers by addressing social norms and promoting gender equity in access to PA facilities. One approach could be to normalise female participation in outdoor physical activity by showcasing women engaging in physical activity in public spaces, as highlighted by the Australian Sports Commission, which emphasises how visibility and representation in public campaigns can positively influence social norms and encourage greater participation among women (Australian Sports Commission 2023). Lastly, future policies should consider cultural expectations and offer practical solutions to help individuals balance physical activity with family and work commitments, such as implementing flexible working hours, or supporting work-from-home arrangements to allow more time for exercise. Similar initiatives have been successfully implemented in Brazil, where providing flexible

work options has led to increased physical activity participation, improved well-being, and better work-life balance (de Oliveira da Silva Scaranni et al. 2023).

Strengths and limitations

Strengths of this study include being the first to qualitatively examine physical activity experiences of people in the southern region of Saudi Arabia. Our regional focus provides unique insights into the cultural and environmental dynamics that influence physical activity, offering a valuable addition to the broader literature on physical activity behaviour in Saudi Arabia. Second, our study includes a diverse group of participants, representing different age groups, backgrounds, and experiences, which enhances the richness and applicability of the findings. Limitations include fewer female than male participants which may have influenced the range of perspectives captured, particularly on gender-specific barriers. However, we did have the opinions of five women and men also were asked to reflect on the influence of gender. Additionally, due to differences in climate, available facilities, and social norms, the findings drawn from the southern region may not be fully generalisable to the diverse characteristics of other regions of Saudi Arabia.

Conclusion

Government efforts to shift cultural norms and improve infrastructure have been recognised by residents of the Southern region of Saudi Arabia. However, persistent gender inequities and mixed reception to physical activity campaigns highlight areas for further development. As cultural norms evolve, it is imperative to establish supportive infrastructure and inclusive policies will be essential in promoting sustainable physical activity behaviours. There is optimism, as the social and physical environment is becoming more conducive to physical activity. Yet, structural inequities, especially for women, continue to create uneven benefits. Future campaigns should focus on normalising a broader range of physical activity options for everyone, with a special emphasis on women, and promoting active travel. Ensuring

that physical activity policies are inclusive and culturally sensitive will foster a more supportive and sustainable environment for all.

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Appendix 1

Interview guide

Introduction

Welcome, and thank you for agreeing to participate in this interview.

I am Ali Alzahrani, and I am conducting this interview as part of a study aimed at understanding the facilitators and barriers to physical activity in the southern region of Saudi Arabia.

Purpose of the interview

From this interview I am aiming to gather your insights and experiences regarding the factors that either support or hinder your engagement in physical activity. I am also interested in hearing your perspectives on the challenges and opportunities associated with promoting physical activity in the southern region.

There are no right or wrong answers, and the goal is to get your personal opinions.

Your role

I am really looking forward to hearing from you because I want to:

- Capture your views and experiences on physical activity in the southern region of Saudi Arabia.
- Capture your views and experiences of the challenges you face in staying active, and Explore your views and experiences regarding things that you enjoy and that motivate you to engage in physical activity.

Confidentiality

I would like to clarify that your privacy is of utmost importance. Any information provided during this interview will be treated with strict confidentiality. Your identity will not be disclosed in any publication coming out of this study, and any identifiable details will be anonymised to ensure privacy. We will not identify you in the results - anyone reading the results of the study would not be able to identify anyone who has been interviewed from what is said. I just want to let you know that the interviews will be reviewed by my doctoral supervisors at the University of Technology Sydney for the purpose of data analysis, but the transcripts will be anonymised so they will not know the identity of the people I was speaking with.

Duration and consent

This interview might take up to 30-45minutes depending on how much you have to say. Is that length of time O.K. for you, or is there anything you might need to rush off to? [if they do, then say we will try and get as far as we can and then, if we do not finish, would you like to schedule another time?] If you have any questions before we begin, feel free to ask. With your permission, I'd like to audio record our conversation to make sure I capture everything you say. Is that O.K. with you? I may at some points make some notes – they are just to remind me what I might need to come back to get more detail on, so I am not interrupting you. I have an interview guide, but my questions will be shaped by what you tell me, so it is more like a conversation.

[I will start the Zoom audio recording at this point if consent is given. If consent is not given to audio record, then I will ask if it is O.K. to take notes]

Before we commence, could you please confirm your understanding of the interview's purpose and freely consent to participate? If there are specific questions you would rather not answer, you can let me know during the interview.

Background information

Demographic characteristics

To start off with, I just would like to get a few personal details from you?

- Can I please get your age?
- What is the highest level of education? [prompt if needed] When did you graduate?
- What is your current occupation? And how long have you been in that position?
- [if retired] In which sector did you work if you were employed before retiring?
- What is your marital status?

Thanks for that. Now, we will move on to the next topic.

Physical activity behaviour

- The first topic I would like to talk about with you is your physical activity. What types of physical activity do you currently do regularly?
 - What is it that you like about X? [ask this about each type of PA they mention]. How long have you been doing X? Was there anything in particular that prompted him to start X?
 - Can you describe how often you do X?
 - How long do your typical physical activity sessions last?
 - Do you have any additional thoughts to share, or anything else you would like to discuss about your current physical activity?

Activity settings

[acknowledge what the person has said] So just moving now to where you like to do your physical activity.

- Where do you usually engage in physical activity? What are the places you usually go to walk? (e.g., gym, home, outdoors)
 - [ask if other locations are preferred]
 - What is it about these locations that you particularly like? [ask why you like that particular thing or things]
 - Are you driving or walking to these places?
 - What differences exist between these locations (X,Y) that you prefer? [ask which one do you prefer more? and why?]

Motivation and goals

Now, let's talk about the things that make you enjoy physical activity and the goals you aim to achieve.

- Do you have specific fitness or health goals that drive your physical activity? [If say 'yes' ask] how they drive your physical activity?
- Is there's a particular type of physical activity that you find challenging? [If say 'yes' ask]: How do you motivate yourself to do it?
- Why do you continue to engage in a specific physical activity, even if it's not your favourite? [ask] how x and y motivate you?

Preferences and enjoyment

Let's now move on to the things you prefer and enjoy in engaging in physical activity.

- What factors contribute to your enjoyment of physical activity? [ask] why x and y make you enjoy physical activity?
- What differences exist between physical activity X and Y in terms of enjoyment? [ask] how these differences affect your physical activity?

Emotional response

Now, let's move on to your feelings about physical activity.

- How do you generally feel before engaging in physical activity? [ask] Why do you feel that way?
- What about during physical activity? [ask] Why do you feel that way?
- What about after engaging in physical activity? [ask] Why do you feel that way?
- Have you noticed any emotional or psychological benefits [other than those already mentioned in response to the previous questions] from your physical activity routine? [if yes] what are these benefits? [ask] How does x and y improve your mental state?

Challenges and difficulties

[acknowledge what the person has said] Very well. Now, let's discuss the challenges you face regarding physical activity

- Can you identify any difficulties you face in maintaining a regular physical activity routine? [if yes] what are these difficulties? [ask] How does x and y affect your physical activity routine? [ask] What are the things you do to avoid these difficulties?
- Are there specific aspects of particular types of physical activity that you find challenging? [if yes] What are these? [ask] Why do you find X and Y challenging?
- Are there specific factors that make it more challenging for you to be physically active in the southern region? [if yes] What are these challenges? [ask] How does it differ from other regions of the kingdom? [ask] How do X and Y impact your physical activity?

Impact on behaviour

Let's now discuss these factors you mentioned and their impact on your physical activity

- How do these affect your overall physical activity behaviour? [ask] Why do you think this affects your physical activity behaviour?
- Have you noticed any changes in your activity levels due to these challenges? [if yes] what are these changes?

Coping strategies

- How do you tackle the obstacles you mentioned when it comes to staying active?
 - What seems to work best for you to overcome these obstacles? [ask] Why do X and Y work for you? Is there anything that you have tried which didn't work so well? [fully explore this] [if say yes] Are there any strategies you have tried? [ask] Why do you think X and Y work for you? where did you get this strategy from?

Facilitators

- Are there any environmental or community factors that could help your physical activity habits? [if yes] What are these factors? [ask] How do x and y affect your physical activity habits?

Dynamic follow-up questions

Changing perspectives

- If the participant reports a change in physical activity behaviour, inquire about the factors that influenced this change.
- Ask if there were specific events or interventions that prompted modifications in their routine.

Environmental influences

- If the participant highlights environmental factors, explore how these factors interact with their physical activity habits.
- Ask if there are community initiatives or changes that might encourage more physical activity.

Conclusion

Final comments

Thank you for your time and valuable insights.

- Do you have any additional thoughts to share, or anything else you would like to discuss?
- Do you have any questions for me?

Interest in results

- Are you interested in receiving the results of the study?
- Would you be willing to participate in a follow-up interview if needed?

Thank you once again for your participation. Your input is instrumental in enhancing our understanding of physical activity facilitators and barriers in the southern region of Saudi Arabia.

CHAPTER



7 DISCUSSION

7.1 Overview

The discussion chapter synthesises the key findings from the three studies presented in this thesis, providing a comprehensive interpretation of how policy, cultural, social, and environmental factors influence physical activity in the Gulf region, particularly in the southern region of Saudi Arabia.

7.2 Key findings

This thesis was structured progressively, allowing for the publication of individual chapters throughout the research process. In line with the Socio-Ecological Model (SEM), the results were synthesised into five key findings that summarise the core contributions of this doctoral research across multiple levels of influence, including individual, interpersonal, institutional, community, and policy levels to:

1. **PA policies shape physical activity environment:** Across Saudi Arabia and Oman, cross-sectoral collaboration remains weak, hindering the successful implementation of physical activity policies.
2. **Lack of implementation and evaluation mechanisms:** In the six GCC countries, there is a noticeable gap in the implementation and evaluation of physical activity policies. The absence of economic assessments and funding for marginalised groups, including women, people with disabilities, and immigrants, weakens the effectiveness of existing policies.
3. **Gaps in reducing sedentary behaviour:** Unlike in other parts of the world, none of the GCC countries have policies specifically targeting the reduction of sedentary behaviour, which is a crucial component in tackling rising rates of NCDs alongside other contributing factors such as unhealthy diets, and physical inactivity [96, 129].
4. **Community and private sector role in PA promotion:** In Saudi Arabia, community-based programs and private sector involvement play an essential role in promoting physical activity outside of government frameworks. However, more collaboration and financial support are needed to scale these efforts.

- 5. Cultural and social barriers in the southern region:** In the southern region of Saudi Arabia, cultural norms and social expectations, particularly concerning gender, significantly influence physical activity participation. Physical activity remains limited due to perceptions of safety, cultural boundaries, and a lack of inclusive physical activity opportunities. Addressing these challenges requires attention to transport planning, the physical environment, and cultural norms that make it difficult for people to prioritise healthy levels of physical activity, including rethinking the placement of physical activity infrastructure to ensure it is convenient and accessible to where people live and work.

7.3 Revisiting the research questions

To recapitulate, this doctoral research aimed to examine the physical activity policy environment in the six Gulf Cooperation Council states and understand the factors that shape physical activity in the southern region of Saudi Arabia. This goal was accomplished through systematic exploration of the research questions through three studies, each addressing different aspects of these influences. By pursuing the specific objectives outlined in Table 3 (below), the research provided a comprehensive understanding of how physical activity policies shape the physical activity environment by interacting with cultural norms, social dynamics, and environmental factors, ultimately influencing participation and engagement in the region. These insights will contribute to developing more effective interventions, grounded in investments at the upper levels of the social-ecological model, that focus on creating system-level conditions tailored to the local context, either by leveraging existing cultural and environmental strengths or by addressing and overcoming barriers, enabling individuals to fulfill their desire and need to be active in ways that align with their specific circumstances.

Table 3: Studies, objectives, approaches, and social ecological model (SEM) levels of the research, aligning with the corresponding research questions

Studies	Objective	Approach	SEM Level	Research question
1 & 2	To understand the mechanisms which underpin policy development and implementation. To define/describe the physical activity policy document environment and assess the quality and application of those policies in the GCC.	Qualitative study using semi-structured interviews to identify perspectives and opinions of stakeholders regarding physical activity policies and their implementation in the GCC countries. Qualitative study based on the approach by Gelius et al. (2021) and the HEPA PAT for physical activity policy monitoring to conduct a comparative analysis of PA policies across all GCC countries.	Policy and organisational levels: Focuses on how policies are developed, implemented, and aligned with institutions.	How do the contents and approaches of national physical activity policies in GCC countries intersect with the cultural, social, and environmental factors influencing physical activity in the southern region of Saudi Arabia?
3	To understand how individuals account for their experiences	Qualitative semi-structured interviews with the adult	Policy, community, institutional, interpersonal and	Which factors influence individual's choices and

Studies	Objective	Approach	SEM Level	Research question
	with physical activity in the southern region of Saudi Arabia. Document how government efforts to promote physical activity are viewed by residents in the southern region.	population from the southern region.	individual levels: Examine the physical environment, organisations ,culture, as well as interpersonal relations.	experience of physical activity in the southern region of Saudi Arabia and how are government efforts to promote physical activity viewed by them?

The main research questions are restated and examined below.

What physical activity policies exist in the six Gulf Cooperation Council countries, how are they developed, implemented and evaluated, and how well do they address the specific jurisdictional and population contexts of each region? The findings of this thesis provide a broad overview of the physical activity policy landscape in the six GCC countries, with each study offering insights at varying levels of depth. While the second study comprehensively examined policies across all six countries, the other studies (Study 1 and 3) focused on Saudi Arabia and Oman, respectively the southern region of Saudi Arabia. This variation in scope allows for both commonalities and unique challenges in policy development and implementation. Acknowledging these differences enriches the understanding of how tailored approaches can address specific cultural, social, and environmental barriers to promote physical activity effectively. The research identified an absence of comprehensive policies targeting sedentary behaviour and emphasised the critical role of cross-sectoral collaboration for effective policy implementation. When aligned with the influences identified in the southern region of Saudi Arabia, such as limited access to safe spaces for physical activity and the restrictive influence of cultural norms, this

doctoral research revealed a need for further improvement of the environment and a shift in cultural norms. Specifically, the findings suggest that tailored approaches are necessary to ensure policies address the unique cultural, social, and environmental dynamics of the region. This includes integrating local perspectives into policy design, addressing infrastructural limitations, and collaborating with community leaders to promote accessible physical activity opportunities that are culturally acceptable while fostering gradual, long-term cultural shifts toward prioritising active lifestyles.

Which factors influence individual's choices and experience of physical activity in the southern region of Saudi Arabia and how are government efforts to promote physical activity viewed by them? The findings of this doctoral research indicate that while national physical activity policies in GCC countries often emphasise collaboration between health, education, and sports sectors, they do not fully account for the cultural and social dynamics that shape physical activity participation in specific regions like the southern part of Saudi Arabia. For instance, these policies generally aim to promote universal access and participation but fail to consider deeply ingrained cultural norms, such as gender-specific expectations, concerns over safety, and systemic additional costs (effort and money) for women which significantly limit physical activity opportunities for women and other groups. Additionally, the policies often frame physical activity in broad health promotion terms, overlooking the community's perception of physical activity as an investment, viewed as a commitment requiring time, effort, and resources with expected tangible benefits which competes with other activities such as work and family obligations. This mismatch highlights a gap between policy objectives and the lived realities of local populations, underscoring the need for policies to better account for the cultural and social contexts of specific regions. The southern region's unique social environment, where distinct cultural norms heavily influence physical activity choices, suggests that national policies require greater flexibility and cultural sensitivity to address these specific barriers effectively.

7.4 Discussion of physical activity policies in Saudi Arabia and Oman within the framework of the social-ecological model (SEM)

This study examined cross-sectoral barriers and facilitators for physical activity policy development, implementation and evaluation in Saudi Arabia and Oman by interviewing high-level stakeholders from their Ministries of Health, Sports, and Education. Oman established a national policy framework for physical activity in 2014 [130] under the umbrella of the Oman Vision 2040 [131], three years before Saudi Arabia introduced its Quality of Life Program [132] under the umbrella of the Saudi Vision 2030 [88]. Many programs and initiatives to enhance physical activity in both countries were identified, particularly sports initiatives. However, it is worth noting that these efforts often lack comprehensiveness and face challenges in effective implementation – observations that are in line with findings from a survey on national physical activity policies by Klepac Pogrmilovic et al. [96]. As observed in previous studies from Saudi Arabia, the programs and initiatives are predominantly focused on urban areas and may neglect rural communities [44, 133]. Interest in promoting gender equity in physical activity in Oman was prominent, with several programs for females; there was less focus on gender equity in Saudi Arabia. However, this may have been the case in the past (prior to 2017). Since the launch of the Saudi Vision 2030, there has been a significant shift toward supporting physical activity and sport participation among girls and women in the Kingdom. As highlighted in this thesis, physical education curricula were introduced in all public schools starting in 2017, and the training of female PE teachers at universities has become widespread. Participation of women in competitive sports at both national and international levels has intensified, and the lifting of the ban on women driving has enabled greater independence and access to sporting opportunities. Furthermore, fitness centers for women have been officially permitted since 2018 and have become increasingly common across the country. Physical activity initiatives aimed at promoting active living for both men and women have expanded considerably in recent years. Notably, the Saudi Public Health Authority has launched ambitious initiatives targeting two key sectors: schools and primary healthcare settings [63]. Policies for promoting physical activity should also support individuals with special needs, patients, and the elderly by

implementing community programs targeted at these groups, such as walking groups and fitness classes for older adults, and programs targeting people with chronic conditions. Additionally, it is important to focus on policies and programs that support gender equality in physical activity and health because cultural and societal norms in Saudi Arabia and Oman can create unique barriers to women's participation[107].

The finding regarding insufficient backing of policy interventions to create environments supportive of physical activity in both countries aligns with a study by Allender et al. who interviewed stakeholders in local government in Victoria, Australia, to analyse physical activity policies and initiatives. Similar to our findings from Saudi Arabia and Oman, they identified a lack of relevance and competing priorities (i.e. promoting healthy eating environments was not considered a priority above food safety) as reasons for the lack of support towards creating supportive environments for physical activity and healthy eating [134].

Health in All Policies has been embraced in Saudi Arabia by integrating the promotion of physical activity into policy development across various areas such as education, sports, and the private sector. However, while this integration is mentioned in the respective documents, challenges in implementation may be due to limited cooperation between sectors. Many partnerships have been established with multiple parties in the Kingdom (MoH, MoS, MoE, and the Ministry of Municipal and Rural Affairs) to further develop physical activity policies in each sector and to remove obstacles to the implementation of physical activity programs. According to a WHO report from 2017, promoting Health in All Policies in Saudi Arabia has been identified as a national priority, monitored by the Ministry of Health [135]. As indicated by the findings, intersectoral collaboration in Oman is less developed than in Saudi Arabia, hindering the integration of physical activity policies across sectors. Unlike Saudi Arabia's comprehensive approach of Health in All Policies, Oman relies more on individual agency initiatives. However, there is potential for improvement in Oman to strengthen intersectoral collaboration and enhance the integration of physical activity policies by establishing a comprehensive policy framework and promoting coordinated efforts among sectors. For instance, the Omani government could create an

intersectoral task force or committee dedicated to fostering collaboration. This approach aligns with practices observed in Canada, where multisectoral collaborations have been instrumental in developing and implementing physical activity and built environment policies [136].

In Saudi Arabia the non-profit sector, represented by community groups, plays a significant role in promoting physical activity outside of the government framework, aided by the promotion of physical activity by influencers and celebrities through social media platforms [91]. By contrast, the physical activity policy stakeholders that I interviewed for Study 1 did not mention any significant involvement of the non-profit sector in physical activity promotion in Oman, either because these types of organisations do not play a role or because their role is not valued by the government stakeholders that I interviewed. The private sector contributes to promoting physical activity in both countries, with particularly strong partnerships with the governmental sector in Saudi Arabia perhaps because tax benefits exist for companies that encourage and promote physical activity in Saudi Arabia [88]. There are previous examples of these types of partnerships in Oman, such as a collaboration between the education and private sector aiming to create a healthier environment and lifestyle in schools [130]. These partnerships have been achieved through the provision of financial support and sponsorships, specifically targeting sports equipment, facilities, and physical activity programs in schools [137]. However, insufficient budget allocation in this area was considered a challenge, which is consistent with our findings, with most participants from the Sultanate expressing the need for greater financial support from the private sector.

Policy limitations differ between both countries, mainly due to the health transformation in Saudi Arabia, specifically with the Kingdom's Vision 2030 [138]. The slow pace of transformation in various Saudi public health, infrastructure, urban planning, sports, and recreation policies may impact their likelihood of being fully implemented by 2030, potentially falling short of WHO's target for increased physical activity by that year set in their Global Action Plan on Physical Activity [41]. One of the objectives of the health sector transformation and the Quality of Life Program is to decrease the proportion of the Saudi population who are insufficiently physically active below 67% by 2030 [138].

The government has taken proactive measures to promote physical activity, investing in initiatives that raise awareness about its importance and the associated health benefits. This includes campaigns, public awareness programs, and the establishment of recreational facilities to facilitate physical activity. In Oman, more collaboration between political parties is essential to improve the implementation of physical activity policies. According to one participant from the Omani MoH, several meetings were recently held with all parties to create plans to better implement physical activity policies. These meetings have led to increased monitoring and stricter enforcement by the Omani government regarding the implementation of physical activity policies in all relevant ministries. Effective health system policies significantly depend on inter-institutional collaboration. While primary health institutions play a central role, the impact of related entities is equally crucial. Educational bodies, sports organisations, and community health centres contribute significantly to decision-making processes. Their closer involvement would ensure a more comprehensive approach to promoting physical activity, enhancing wellness, and preventing lifestyle-related diseases [139].

According to previous studies, insufficient funding for promoting physical activity, and more broadly for NCD prevention, is a challenge in both Saudi Arabia and Oman [107-108]. Similarly, in a US study, state public health practitioners were interviewed about the National Physical Activity Plan, who also identified implementation costs and the complexity of physical activity policies as significant challenges [140]. Financial incentives and private sector involvement, while valuable, do not ensure adequate funding for all aspects of public health initiatives. The private sector's contribution is often focused on areas aligned with their business interests or corporate social responsibility. Nevertheless, in Saudi Arabia, certain private sector companies run national programs, such as the Tatweer Educational Company, a private holding dedicated to implementing the government's education reform initiative [43, 99]. Enhancing funding for the implementation of physical activity policies in the Gulf region holds great promise in advancing infrastructure, cultivating a proficient workforce, and fostering research initiatives. Based on the Saudi Quality of Life document 2030 [132], the budget of the Ministries of Health, Sport and Education for promoting physical activity will likely increase until 2030.

The monitoring and evaluation of policy implementation across ministries in both countries is challenging due to the absence of comprehensive and precise data on physical activity prevalence in key sectors such as health, sport, and education. Therefore, there is an urgent need to address data quality issues, such as inconsistent measurement methods employed across different sectors, which make it difficult to compare and consolidate data, and the lack of standardised protocols which undermines the accuracy and reliability of prevalence estimates. To efficiently monitor policy implementation, the responsibility could, for instance, be entrusted to the MoH for coordination with all pertinent sectors, while the General Statistics Authority should be designated to collect data on physical activity.

Responsibility for ensuring data quality rests with various stakeholders involved in the data collection, including researchers, survey administrators, data analysts, and policymakers. These stakeholders must work collectively to implement robust data collection methodologies, appropriate sampling techniques, rigorous quality control measures, and transparent reporting practices. Monitoring of the impact of policies on population levels of physical activity in Saudi Arabia and Oman has improved, but more work is needed, particularly in the education sector in Oman which requires evaluation of the progress and impact of policies.

The policy level of the social-ecological model emphasises the importance of systemic and structural approaches to promoting physical activity [22], focusing on the development and implementation of coordinated policies that address multiple determinants of physical inactivity. These policies involve creating supportive environments, regulating and incentivising physical activity opportunities, and integrating efforts across various sectors to ensure accessibility and sustainability of initiatives [8]. By addressing structural barriers, such as infrastructure, funding, and governance, this level aims to create a foundation for sustained physical activity promotion within populations. To create and implement comprehensive policies, programs, and supporting environments, a variety of sectors must collaborate in both countries. This may include transport, urban planning, media, social work, religious and cultural affairs [107]. In Saudi Arabia, one of the most effective health-promoting practices is physician-recommended physical activity [92], which is recognised as one of the eight best investments for physical

activity by the International Society for Physical Activity and Health [9]. Therefore, the primary healthcare system in the Gulf region has a critical role in the promotion of physical activity, and further policy development in this area would be promising [92]. As well, physical education policies in schools play an integral part in the Gulf states [141]. Educational institutions in Saudi Arabia and Oman are crucial in promoting physical activity among various age groups. From childhood through adolescence to young adulthood, schools offer structured physical education programs, health education, and gender-inclusive activities. Universities support these efforts by providing sports facilities, activities and conducting research on active lifestyles. Coordinated national policies amplify the effectiveness of these initiatives [25, 142-143]. On the other hand, active transport and urban design policies have not yet been developed sufficiently to become potential contributors to population levels of physical activity in these countries due to cultural, environmental and climatic differences [107].

7.5 Discussion of the comparative analysis of physical activity policies in the six Gulf Cooperation Council Countries within the framework of the social-ecological model (SEM)

The findings offer an initial understanding of the prevailing landscape of physical activity policies, and the spectrum of potential strategies influencing policy formulation within the Gulf region. Regarding policy-making structures, the Gulf nations share common political systems, mostly characterised by centralised governance. In general, health ministries in the Gulf region are the primary agency tasked with policies to enhance physical activity in the community. With all Gulf countries being members of the Gulf Health Council, the monitoring of physical activity for policy agenda-setting is consistent across all countries, which may improve the consistency and effectiveness of policy implementation. This unified approach ensures that data collection and evaluation methods are standardised, allowing for cohesive and comparable assessments of physical activity initiatives and their outcomes throughout the region. However, there are differences in leadership roles regarding policy formulation among these countries. In Oman and Saudi Arabia, the formulation of physical activity policies involves collaboration

between the Ministries of Health, Sports, and Education. Conversely, in Bahrain, Kuwait, Qatar and the UAE this responsibility rests solely with the Ministry of Health. Generally, the identified policy documents outline formal partnerships between ministries within each country, but also reveal the existence of collaborations with the non-profit and private sectors.

A comparative examination indicates that decision-making primarily revolves around health and sports sectors, with the education sector following suit. While Oman, Qatar, and Saudi Arabia have centralised policy documents guiding the promotion of physical activity, no such overarching policy document was identified in Bahrain, Kuwait, or the United Arab Emirates. Regarding policy implementation, there is a relatively comprehensive coverage for the main targeted groups in society, including women, but not for people living with disabilities and immigrants. This might be partially due to insufficient infrastructure for physical activity in the Gulf region, at least in the case of people with disabilities [144]. It is noteworthy that in the GCC countries immigrants are not small minorities. In Qatar and the UAE, they account for nearly 90% of the population, and the average across all six GCC countries is 52%. This underscores the importance of addressing the needs of immigrants, particularly given the lack of specific strategies to reach this significant demographic [145]. A significant observation from our study in this regard is the lack of information on funding designated for physical activity policies, with funding often sourced from health ministry budgets aimed at counteracting chronic disease. Lastly, we found that while select physical activity policies in all six GCC countries include some form of evaluation, there is a noticeable absence of economic evaluation, unlike in European countries, such as Germany, Ireland, and Poland, where economic assessments are commonly integrated to measure policy effectiveness and cost-efficiency [18]. However, nearly 43,000 people die each year in the GCC countries from the four major non-communicable diseases (NCDs), accounting for 43% of all deaths in the region [146]. Additionally, NCDs impose a significant economic burden, costing the economies of the GCC countries approximately US\$50 billion annually, equivalent to 3.3% of their 2019 GDP. Investment cases for NCD prevention in the GCC demonstrate that such efforts can yield substantial health and economic benefits. For instance, implementing model interventions could cost US\$ 14 billion over 15 years,

increasing health expenditure by 1.4% annually, or US\$ 16 per capita, while potentially averting 290,000 premature deaths and generating US\$ 49 billion in productivity gains [146]. Increasing physical activity levels in Saudi Arabia could prevent an estimated 80,000 to 110,000 deaths and 2.0 to 2.9 million disability-adjusted life years (DALYs) between 2023 and 2040. This translates to approximately 4,700 to 6,500 deaths and 118,000 to 171,000 DALYs prevented each year. Moreover, it could substantially reduce economic losses from insufficient physical activity, which are currently valued at 0.49% to 0.68% of the country's GDP, or about US\$5.4 to US\$7.6 billion annually [28].

Concerning the physical activity campaigns and initiatives in Gulf countries mentioned in Table 4, the policy documents did not reveal thorough evaluation of these efforts. physical activity prevalence is a long-term outcome, and there is little information on more proximal measures of implementation. as previous research has shown that only including long-term indicators often fails to identify earlier changes which lead to long term outcomes because of the time taken to change behaviour [147]. Process indicators, such as program reach, policy enforcement, and facility access, are crucial in this context as they demonstrate what may be responsible for program failure and success. For example, program reach measures the number of people involved in policy-driven initiatives, policy enforcement evaluates the adoption and enforcement of relevant local regulations, and facility access assesses the availability and usage of public spaces and facilities that promote physical activity [147]. Overall, the evaluation of physical activity policies requires more focus on such process indicators to demonstrate how implementation may be improved given that Gulf countries continue to experience high rates of obesity and insufficient activity levels [7, 14]. Notably, Oman, Qatar, and Saudi Arabia are further advanced in terms of their policy maturity and implementation efforts, showing better progress compared to other Gulf states.

Physical activity policies in the GCC countries can be analysed through the lens of the four GAPPAs areas: Creating active societies, active environments, active people, and active systems [41]. Our analysis indicates that "active societies" is moderately developed, with awareness campaigns and educational initiatives present in Oman, Qatar, and Saudi Arabia [108]. However, these efforts are less consistent in

Bahrain, Kuwait, and the UAE. “Active environments” is the least developed area across all GCC countries, with insufficient infrastructure to support physical activity, particularly for people with disabilities and immigrants, as highlighted earlier [7]. While some policies emphasise the development of public spaces for physical activity, implementation gaps persist, particularly in urban areas with significant immigrant populations [145]. As well, the hot climate and desert environments in large parts of the GCC mitigate against environmental change policies that promote physical activity. “Active people” is partially addressed through community and school-based programs, though there is limited inclusion of marginalised groups, such as immigrants and individuals with disabilities. Lastly, the development of “active systems”, involving policy integration, funding, and evaluation, shows varied progress. Oman and Saudi Arabia have relatively advanced central policy frameworks and collaboration across ministries [112], while Bahrain, Kuwait, and the UAE lack centralised policy documents and sufficient economic evaluations. This variation underscores the need for targeted strategies to strengthen weaker areas, such as active environments, while building on the progress made in fostering active societies and systems.

The findings corroborate previous research conducted in the Gulf's two largest countries, Oman and Saudi Arabia. Albululaya et al. [148] employed the Comprehensive Analysis of Policy on Physical Activity (CAPP) framework to evaluate physical activity policies in Saudi Arabia, while Al Siyabi et al. [108] used the HEPA PAT tool for their analysis of Oman. Both studies highlighted the pivotal roles of health, sports, and education ministries in shaping physical activity policies, as we observed across these and other Gulf countries. This consistency underscores the critical influence these ministries have in driving policy across the region, emphasising the need for coordinated efforts to enhance policy outcomes. Our study further confirms previous research [148] regarding funding allocated to physical activity policies. These allocations often are shared across initiatives aimed at enhancing quality of life and at addressing chronic diseases across all Gulf states. However, the funding models make it challenging to disentangle the specific value of investments and directly link them to outcomes [149]. Therefore, transparency is important for a more accurate evaluation of future physical activity policies. In

addition, funding for physical activity policies typically originates solely from health ministries, indicating that a comprehensive, integrated government policy approach has not yet been fully realised.

Another noteworthy observation regarding policy formulation is the lack of policies and recommendations targeting the reduction of sedentary behaviour. Sedentary behaviour, distinct from physical inactivity, involves prolonged periods of sitting or low energy expenditure activities, which pose unique health risks [42]. This observation is supported by research indicating that the study of sedentary behaviour remains relatively nascent in the region [150-151]. Studies conducted in 2009 and again in 2019 among Saudi adolescents aged 15-19, using the same design, methodology, and instruments, showed that while overall physical inactivity had generally declined, sedentary behaviour, defined as more than three hours per day of screen time, increased significantly, from 77.3% in 2009 to 80.6% in 2019. This rise is largely attributed to the lack of policies specifically targeting the reduction of sedentary behaviours within the population [13, 152]. By contrast, countries like Australia and Canada have formulated comprehensive policies and public health campaigns aimed at reducing sedentary time, particularly among children and adolescents [129, 153]. Taking into account the different social, cultural, and environmental contexts, these examples highlight the potential for the Gulf countries to develop similar policies that address this emerging public health challenge.

At the policy and institutional levels of the SEM [22], the findings emphasise the need for stronger integration and alignment across sectors to enhance the development and implementation of physical activity policies. While Gulf countries have made strides in centralising policy formulation within key ministries, such as health, sports, and education, the lack of active involvement from other sectors, like transportation, urban planning, and social development, hinders the holistic implementation of these policies. For example, addressing infrastructure gaps for people with disabilities and immigrants requires collaboration beyond health ministries to include urban planning and public works departments. Additionally, the absence of specific funding streams and economic evaluations highlights institutional shortcomings in prioritising and sustaining physical activity initiatives. These gaps underscore the necessity of embedding physical activity promotion within broader institutional frameworks to create

sustainable and effective policy ecosystems. The social-ecological model (SEM) can help address these challenges by providing a comprehensive framework that considers multiple levels of influence, ensuring that interventions are not only targeted at individuals but also embedded within supportive environments and systems. By leveraging the SEM, policymakers can facilitate cross-sectoral collaboration by identifying synergies between health, urban planning, transportation, and education sectors, fostering a coordinated approach to physical activity promotion. Moreover, applying the SEM can aid in the development of culturally and contextually appropriate strategies that consider social norms, community dynamics, and environmental constraints, ultimately leading to more inclusive and sustainable physical activity initiatives across the Gulf region.

7.6 Discussion of perspectives and opinions on physical activity from the southern region of Saudi Arabia within the framework of the social-ecological model (SEM)

The generated two key themes, namely *Release with Restrictions*, and *PA as Investment*, showed physical activity was well understood as having immediate positive physical and psychological impacts as well as long-term health value. However, its enactment was subject to systemic barriers and inequities which foreclosed on some opportunities and rendered others less attractive. In weighing costs (literal and metaphorical) against returns, among our interviewees women seemed to have more complex calculations as the conservative culture of the region brought a gendered overlay to the choice made.

Across the accounts, walking often emerged as the physical activity of choice. According to our interviewees, walking provided not only a health dividend, but co-benefits as it could be done with other people or alone if desired. The costs are low and government investment in infrastructure meant there were safe options for men and women, and for the latter it is a socially accepted form of exercise. However, on the cost side there was some criticism that there were not enough designated paths to satisfy demand. Given the dominance of car culture and the time cost associated with traveling to designated walking areas, further investment in walking infrastructure is crucial. Prioritising increased neighbourhood walkability not only could reduce the reliance on cars and make active travel more

accessible but the social acceptability of engaging in such activities within the community could also increase. A study conducted in Hong Kong examined how improvements in the walking environment can lead to shifts from car usage to active travel modes, such as walking and cycling. The research found that enhancing walkability positively influenced individuals' decisions to choose active travel over driving, contributing to a cultural shift towards more sustainable transportation habits [154]. Consistent with the SEM framework [22], supportive physical environments at the community level encourage physical activity participation by lowering logistical and social barriers.

The findings also emphasise the need for diversity in physical activity options. While walking was preferred by many for its high return on investment, others expressed a desire for activities that offered co-benefits such as social interaction or enjoyment. Environments which cater to a range of needs and go beyond physical fitness to deliver social and emotional benefits as reflected in participants' experiences are required [155-156]. For example, the global phenomenon parkrun powers much of its popularity to combining physical activity with social interaction amongst participants [157].

Government efforts in physical activity-friendly policy and infrastructure development, including inclusive social campaigns, it seems have played a role in shifting cultural norms around physical activity in the southern region of Saudi Arabia. As a part of Saudi Vision 2030, Giga projects are large-scale, transformative initiatives designed to diversify the economy, promote sustainability, and improve quality of life across the Kingdom. The Sport Boulevard in Riyadh will span over 135 kilometres and feature green pathways, sports facilities, and recreational areas to encourage physical activity [77]. The Saudi Green Initiative aims to combat climate change and desertification by planting 10 billion trees over the coming decades, enhancing air quality and biodiversity [158]. King Salman Park, also in Riyadh, is set to become the largest urban park in the world, covering over 16 square kilometres and offering cultural, sports, and entertainment venues [159]. New Murabba is a futuristic downtown development in Riyadh, designed to feature the Mukaab, a massive cube-shaped structure that will house residential, commercial, and entertainment spaces [160]. NEOM is a \$500 billion smart city on the Red Sea coast, integrating cutting-edge technology, clean energy, and futuristic infrastructure [161]. Qiddiya is being developed as a

world-class entertainment and sports city, expected to include theme parks, motorsports tracks, and cultural venues [161]. Lastly, Red Sea Global focuses on sustainable luxury tourism, developing a pristine archipelago with eco-friendly resorts powered entirely by renewable energy [161]. These projects collectively aim to reshape Saudi Arabia's urban, environmental, and economic landscape.

Participants attributed these changes to initiatives that reflect the social-ecological model's emphasis on policy-level interventions impacting individual behaviours [25]. The evolving cultural landscape, particularly in Southern Saudi Arabia, demonstrates a loosening of conservative attitudes, fostering greater freedom in physical activity choices across genders and generations. This shift has enhanced both physical and social safety, making physical activity more accessible and widely accepted [8]. These government-led changes have expanded the range of acceptable and accessible physical activity options, aligning with the themes of 'Release with Restrictions' and 'PA as Investment' by addressing systemic barriers and making some options worth the effort, time and cost [112].

Despite this progress, participants highlighted persistent systemic inequities that impact ROI for women. For example, while gender-segregated spaces provide a level of social safety for women, gym membership costs are often significantly higher for women than for men, limiting their freedom of choice. Addressing this inequity may require policy changes, such as implementing regulations to prevent gender-based pricing disparities, ensuring fair and equal access to facilities. This inequity, which adds to the "cost" of physical activity for women, reflects institutional barriers that need addressing for truly inclusive physical activity promotion [162]. The SEM framework points to this as an area for systemic improvement, as equity in access to physical activity options at both the community and policy levels is crucial to creating sustainable behaviour change [163].

While participants generally welcomed the improvements in physical activity infrastructure, they expressed mixed feelings about physical activity campaigns. These campaigns are often aimed at individuals without addressing the broader systemic challenges that people encounter when trying to engage in physical activity [8]. For instance, our data showed that while campaigns encourage physical activity, impediments, such as higher costs for women, cultural expectations, limited safe infrastructure

for activities like cycling, and the normalisation of prioritising other demands, such as work, and family, persist. This disconnect indicates a need for campaigns that target individual behaviour but also advocate for systemic change such as a campaign for building cycling infrastructure to provide safer and more accessible spaces for all community members. Such initiatives can promote long-term behavioral shifts by addressing environmental barriers and encouraging policy changes that support active transportation and equitable access to physical activity opportunities [7]. By addressing barriers at the policy and community levels, campaigns could resonate more effectively with the population and support lasting change [148].

Participants often cited competing priorities, such as work and family obligations, as major barriers to regular physical activity. As in other studies [164], habit formation and intentional planning were personal strategies to temper these constraints. These solutions align with the SEM's individual level but highlight the limitations of relying solely on personal strategies to overcome systemic barriers [165]. Additionally, working hours intersect with the need for supportive infrastructure and policies that accommodate active lifestyles. For instance, infrastructure supporting active travel to work or the provision of physical activity facilities within or near workplaces could alleviate some of these barriers. Policies, such as flexible working arrangements or working from home, could also help free up time for individuals to engage in physical activity. For example, research found that working from home increased sedentary behaviour (e.g., screen time, sitting) but also boosted domestic physical activity [166-167]. These measures would shift some responsibility from individuals to systemic solutions, better aligning with the SEM's emphasis on multi-level interventions.

In light of the findings, a few key recommendations emerge. For example, developing community sports facilities, separated cycleways, and outdoor gyms could provide varied options that cater to different interests and needs, ensuring that individuals have more opportunities to engage in physical activity that suits their preferences [168]. Additionally, integrating cultural and religious values into physical activity programs, such as gender-specific programs, like providing female-only exercise spaces, could make them more acceptable and appealing to the target population, fostering greater engagement

[169-170]. Moreover, more inclusive campaigns should also address systemic barriers by addressing social norms and promoting gender equity in access to physical activity and exercise facilities. One approach could be to normalise female participation in outdoor physical activities by showcasing women engaging in physical activity and exercise in public spaces, similar to initiatives in Australia, where campaigns have successfully promoted gender inclusivity in sports and recreation. These efforts can be accompanied by messages emphasizing the importance of equal opportunities for health and fitness, helping to challenge societal norms and create a more supportive environment for women to engage in physical activity. [171]. Lastly, future policies should consider cultural expectations and offer practical solutions to help individuals balance physical activity with family and work commitments, such as providing on-site childcare at gyms, implementing flexible working hours, or supporting work-from-home arrangements to allow more time for exercise [172].

CHAPTER

8

8 CONCLUSION, RECOMMENDATIONS, AND FUTURE DIRECTIONS

8.1 Overview

Chapter 8 provides practical recommendations for enhancing physical activity initiatives and addressing the identified barriers. Additionally, the chapter outlines potential future research directions and areas for further investigation to build on the study's contributions.

8.2 Thesis contributions

This thesis contributes significantly to the understanding of physical activity barriers in Saudi Arabia and the broader GCC region, offering practical solutions for improving policy effectiveness and fostering a healthier, more active population.

1. **Comprehensive examination of physical activity policy frameworks in the GCC:** While some previous studies have examined physical activity policies in GCC countries, usually they only looked at one country, only examined a few documents or only interviewed policy makers from one or two ministries. One of the key insights gained from this thesis is the significant knowledge expansion achieved by including multiple sectors such as health, education, sports, and other relevant ministries in the analysis of physical activity policies. This comprehensive approach revealed how cross-sectoral collaboration (or the lack thereof) impacts policy effectiveness, providing a more nuanced understanding of the structural and operational challenges in promoting physical activity across the GCC. By examining all six member states and incorporating a wider range of policy documents and stakeholder perspectives, this research moves beyond the narrow scope of previous studies, offering a holistic view of the systemic gaps and opportunities in the region.
2. **Cross-sectoral and financial challenges identified:** The research brings attention to the lack of cross-sectoral coordination between government agencies and the private sector, emphasising how this impacts policy implementation by creating fragmented efforts, duplications, and missed opportunities to leverage resources effectively. Furthermore, the study sheds light on financial barriers, underscoring the critical need for increased funding to support physical activity

initiatives, particularly for marginalised groups, such as women, individuals with disabilities, and immigrants. These findings highlight gaps in policy development that are crucial for future initiatives.

3. **Cultural contextualisation of influences on physical activity:** The third study in this thesis provides an in-depth look at the specific cultural and social factors that physical activity in the southern region of Saudi Arabia. By examining systemic factors that influence individual decision-making, such as car dependency, perceptions of appropriate public behavior, and cultural norms, the research highlights how physical activity initiatives can be better aligned with the unique social fabric of the region. While it underscores the importance of culturally sensitive health initiatives, it also emphasises the need for a long-term commitment to shifting norms to promote equity in access to and benefit from physical activity opportunities, whether privately or government-managed.
4. **Practical recommendations for policymakers:** By providing clear, actionable recommendations, this thesis serves as a practical guide for policymakers in Saudi Arabia and other GCC countries. The research advocates for the development of more inclusive policies that consider the needs of diverse groups, including women, individuals with disabilities, and marginalised communities such as immigrants. Improved collaboration between key sectors such as health, education, urban planning, and transportation should be fostered by government authorities and policymakers to ensure that physical activity initiatives are well-integrated across different areas impacting daily life. This includes joint efforts to create safe (physically and socially safe), accessible spaces for physical activity and to promote physical activity as a societal priority. Enhanced evaluation mechanisms are also needed to continuously assess policy effectiveness and make data-driven improvements. This contribution is particularly relevant for stakeholders aiming to design and implement more effective physical activity strategies in the Gulf region.
5. **Foundation for future research:** The findings of this thesis provide a foundation for future studies, particularly in exploring the role of marginalised groups, such as women, individuals with

disabilities, and immigrants, in physical activity participation and the long-term effectiveness of policy interventions. This work also opens the door for more extensive research on the impact of digital technologies and innovative solutions, such as mobile health tools, in promoting physical activity.

8.3 Practical implications

1. **Policy development and implementation:** This thesis highlights critical weaknesses in the current physical activity policy frameworks in Saudi Arabia, Oman, and other GCC countries. For example, policymakers should prioritise developing policies that promote physical activity while addressing sedentary behaviour, which is often overlooked. The findings suggest that without a dedicated focus on reducing sedentary lifestyles and ensuring adequate funding for implementation, existing policies may not lead to meaningful change in public health outcomes.
2. **Inclusion and equity in physical activity policies:** One of the major implications of this thesis is the need for physical activity policies that are inclusive of marginalised populations, particularly women, people with disabilities, and immigrants. In the GCC, social and cultural norms often create significant barriers to physical activity participation for these groups. In this context, it should be mentioned that immigrants are not small minority groups in the GCC. They account for the following percentages of the population: Bahrain: 52.6%, Kuwait: 68.7%, Oman: 38.9%, Qatar: 88.4%, Saudi Arabia: 38.8%, and United Arab Emirates: 86.9% [145]. Policymakers must ensure that future policies explicitly target these communities, providing equal access to physical activity opportunities and creating environments that support their participation. For example, a study by Gagliardi et al. (2022) highlights the effectiveness of culturally safe, community-based physical activity programs in promoting participation among immigrant women, emphasising the importance of tailoring initiatives to the specific cultural contexts of marginalised groups [173].
3. **Economic evaluation and sustainability:** The lack of economic assessments in physical activity policy evaluations across the GCC suggests that policymakers may not fully understand the cost-

effectiveness of current initiatives. Introducing comprehensive evaluation mechanisms, such as the Comprehensive Analysis of Policy on Physical Activity (CAPPA) framework, which assesses policy content, implementation, and effectiveness, would help ensure that resources are being used efficiently and sustainably [111]. This could lead to more targeted investments in physical activity programs, fostering long-term improvements in public health.

4. **Culturally sensitive physical activity initiatives:** The research emphasises the importance of designing physical activity initiatives that are culturally and socially sensitive, particularly in regions like southern Saudi Arabia where traditional gender roles and cultural norms heavily influence behaviour. For future initiatives to succeed, they must achieve some degree of alignment with local cultural expectations and provide safe, inclusive spaces for all members of society, especially women. Additionally, the culture would need to shift to make activities such as cycling, horse-riding, or hiking more socially acceptable for women, promoting greater equity in physical activity opportunities.
5. **Private sector and community involvement:** Another key implication is the potential for expanding the role of the private sector and community groups in promoting physical activity. This thesis underscores the current contributions of these sectors in Saudi Arabia and calls for more formal partnerships between governments and these stakeholders. Increased investment and support from the private sector, such as sponsorship of community sports programs and partnerships with local governments to create accessible physical activity infrastructure, coupled with community-driven initiatives, could significantly enhance physical activity participation rates in the region. The World Health Organization emphasises the critical role of the private sector in promoting physical activity through such collaborations [174].
6. **Long-term impact and policy sustainability:** Given the evolving nature of physical activity promotion and the growing obesity and NCD crisis in the Gulf, the findings of this thesis suggest the need for sustained efforts in policy development. Long-term impact assessments and continuous policy evaluations are essential for ensuring that physical activity policies remain

relevant and effective in the face of changing the public health landscape. Incorporating population surveys into these evaluations provides valuable data on physical activity levels and behaviors, enabling policymakers to make informed decisions and tailor interventions to specific community needs. Regular and robust population surveillance of physical inactivity is fundamental to guiding country implementation of the Global Action Plan on Physical Activity (GAPPA) policy, tracking progress toward targets, and assessing the impact of physical activity on non-communicable disease prevention and other health, environmental, and societal goals [41].

7. **Technological innovations in physical activity promotion:** Finally, the implications extend to the potential role of technology in physical activity promotion. Digital health tools and mobile applications could be transformative in overcoming barriers to physical activity, particularly in regions where cultural norms limit traditional forms of engagement. However, their effectiveness in sustaining long-term behaviour change varies. A systematic review by Laranjo et al. (2021) found that interventions using mobile apps or activity trackers led to modest increases in physical activity levels, but the sustainability of these changes over time remains uncertain. Therefore, while digital interventions offer promising avenues for promoting physical activity, their long-term efficacy requires further investigation to ensure enduring behavior change [175]. In addition, Tong et al. (2024) conducted a systematic review and meta-analysis to evaluate the use of mobile technologies in promoting physical activity and reducing sedentary behaviours in the Middle East and North Africa (MENA) region. Their findings suggest that while mobile-based interventions show promise, the current evidence remains preliminary due to significant variability in study design, quality, and duration. The authors emphasise the need for more robust, culturally tailored, and long-term trials, with standardised measures of engagement and implementation to better understand the effectiveness and scalability of these digital health interventions in the MENA context [176]. This thesis suggests that integrating technology into physical activity policy

frameworks could provide scalable solutions for promoting active lifestyles across diverse populations.

These contributions and implications provide a roadmap for advancing physical activity policy development and implementation in Saudi Arabia and the wider Gulf region. By addressing both structural and cultural barriers, the research offers a holistic approach to promoting physical activity and improving public health outcomes in the region. For instance, a qualitative study analysing cross-sectoral barriers and facilitators for physical activity policy development in Saudi Arabia and Oman highlights the importance of leadership and existing policies in shaping effective interventions [112].

8.4 Strengths and limitations of the thesis

This thesis offers a comprehensive exploration of physical activity barriers in the Gulf region, and the southern region of Saudi Arabia in particular, through three studies, each contributing unique insights. A key strength of the first study is its engagement with senior policymakers from the Ministries of Health, Education, and Sports in Saudi Arabia and Oman, the two largest GCC countries, covering about 70% of the GCC population. This direct involvement provides critical insights into policy formulation processes. However, challenges in recruiting participants from other GCC countries due to political sensitivities limited the scope, potentially affecting the generalisability of the findings.

The second study's strength lies in its broad comparative analysis of 39 policy documents from all six GCC countries, offering a rare regional perspective. Unlike prior studies that focused on individual countries or only on one ministry, this research examined policies across multiple ministries, including unpublished documents. Yet, the study faced limitations in accessing certain documents, particularly due to the distinct governance structure of the UAE. Additionally, limited engagement from some policymakers restricted the application of the full HEPA Policy Audit Tool.

The third study is notable as the first qualitative examination of cultural and environmental influences on physical activity in the southern region of Saudi Arabia, using diverse sampling to capture a range of perspectives. However, it faced challenges in involving female participants, which may have led to underrepresentation of women's views. Additionally, a limitation of the study is that it may have attracted a biased sample of individuals already interested in physical activity, meaning their views likely reflect those with a baseline interest in the topic, potentially excluding the opinions of those who are not active or currently interested in PA. Additionally, due to differences in climate, available facilities, and social norms, the findings drawn from the southern region may not be fully generalisable to the diverse characteristics of other regions of Saudi Arabia.

Overall, while each study encountered specific challenges, the thesis provides valuable insights into physical activity policies and cultural dynamics in the Gulf region, emphasising the need for further research to address the remaining gaps.

8.5 Future research and directions

Future research can expand on the findings of this study and address existing gaps or limitations, with particular emphasis on aspects such as policy implementation, cultural adaptation, and the long-term effects of physical activity interventions within the Gulf region. Researchers might explore the following areas for more in-depth investigation:

1. **Evaluating the long-term impact of physical activity policies:** Studies could assess the long-term effects of physical activity policies in Saudi Arabia and other GCC countries, particularly focusing on how sustained policy efforts influence public health outcomes over time. For example, a systematic review by Greaves et al. (2023) assessed the long-term (at least 24 months) effectiveness of behavioral interventions on objectively measured physical activity. The study found that while interventions led to modest increases in physical activity levels, the sustainability of these changes over time remains uncertain [177]. This research could provide valuable insights

into the sustainability of current initiatives and inform adjustments needed to maintain their effectiveness.

2. **Investigating inclusive physical activity strategies for marginalised groups:** Future studies could focus on how physical activity policies can be tailored to better serve marginalised groups, such as women, individuals with disabilities, and immigrant communities [173]. Understanding the specific barriers faced by these groups in the southern region could lead to more targeted policy recommendations.
3. **Studying the role of the built environment in physical activity participation:** Further research could explore how infrastructure, such as parks, recreational areas, and safe walking spaces, impacts physical activity levels in the southern region. A study by Kaczynski et al. (2018) found that proximity to parks and recreational spaces significantly increased physical activity levels in communities, particularly among underserved populations [178]. This would help identify which environmental changes could most effectively increase activity levels among different population groups.
4. **Assessing the effectiveness of cultural adaptation in interventions:** Research could focus on the effectiveness of culturally adapted physical activity interventions, examining how well these programs align with the social norms and values of the southern region. This would provide insights into how cultural sensitivity can enhance the reach and impact of physical activity programs [179].

By addressing these areas, future research can contribute to a more nuanced understanding of the factors that influence physical activity in the Gulf region, leading to more effective policies and initiatives that align with the unique cultural, social, and environmental contexts of the region.

8.6 Recommendations

Based on the research findings in this thesis, several recommendations for future research, practice, and policymaking have been generated to improve physical activity promotion across the Gulf region, with a particular focus on addressing the unique challenges in the southern region of Saudi Arabia:

1. **Strengthen cross-sectoral collaboration:** Governments should enhance collaboration between the health, education, and sports ministries, and other relevant ministries, such as transportation, urban planning, and tourism, as well as between the private and non-profit sectors. In Saudi Arabia and Oman, intersectoral coordination is crucial for successful policy implementation, especially in the promotion of physical activity through out-of-school programs. A study by Gelius et al. (2021) with a comparison of four EU countries recommended establishing formal agreements, such as memorandums of understanding (MOUs), between sectors to clearly define roles, responsibilities, and resource sharing for physical activity promotion [18]. Such mechanisms can ensure sustained collaboration and could be adopted in the GCC region to overcome current coordination gaps.
2. **Increase financial support:** Physical activity policies require sustained funding to ensure long-term success, particularly in addressing marginalised populations. Governments should prioritise financial investments in physical activity programs, especially for women, people with disabilities, and immigrants. For example, a study by Higgerson et al. (2018) evaluated a community intervention in England that provided free access to leisure facilities and outreach support, resulting in increased physical activity levels among low-income groups [180]. This demonstrates how targeted financial support can effectively promote inclusivity in physical activity initiatives.
3. **Develop sedentary behaviour reduction policies:** Across the GCC, there is an absence of policies addressing sedentary behaviour. The development of specific policies aimed at reducing sedentary lifestyles, combined with physical activity promotion, is vital to tackling rising obesity

and NCD rates. For example, a study by El Kirat et al. (2024) highlights the importance of behavioural change interventions informed by theories and techniques to reduce physical inactivity and sedentary behavior, emphasising the need for comprehensive policies that integrate such strategies [181].

4. **Improve policy evaluation mechanisms:** There is a need to strengthen policy evaluation frameworks, particularly by incorporating economic assessments and transparent performance reviews, which involve openly tracking and reporting the outcomes of policies to ensure accountability and allow for adjustments based on measurable results [41]. This will ensure that the impact of physical activity policies is measurable and provides insights for further improvements.

5. **Align physical activity initiatives with local cultural norms and foster cultural change:** In regions like the southern part of Saudi Arabia, physical activity initiatives should align with local social norms and cultural expectations while promoting gradual cultural shifts toward more inclusive attitudes. Ensuring gender equality and creating safe, accessible spaces for physical activity, especially for women, can foster greater community participation and challenge existing barriers. Initiatives should aim not only to respect current cultural norms but also to encourage new perspectives that support equitable access to physical activity opportunities for all. A study by Al-Hazzaa et al. (2018) examined the impact of culturally sensitive physical activity programs on Saudi women's participation rates. The research found that programs designed with cultural considerations, such as women-only facilities and appropriate scheduling, significantly increased female engagement in physical activities [25]. This underscores the importance of tailoring initiatives to cultural contexts to enhance their effectiveness.

8.7 Concluding remarks

Addressing the barriers to physical activity in the Gulf region, particularly in the southern region of Saudi Arabia, requires coordinated efforts from key stakeholders to promote healthier lifestyles. The findings presented in this thesis highlight the ongoing need for stronger cross-sectoral collaboration, more inclusive policies, and culturally tailored initiatives to support physical activity. While significant insights were gained, challenges, such as limited access to policy data and engaging certain demographics, persist. The recommendations provided should guide future research and policymaking, aiming to enhance physical activity participation and overcome the unique barriers in the southern region.

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APPENDICES

Appendix 1: Letters of support from the Saudi Ministry of Health

<p>Kingdom of Saudi Arabia Ministry of Health Directorate of Health affairs - Assir Region 600 / 275</p>	 <p>وزارة الصحة Ministry of Health</p>	<p>المملكة العربية السعودية وزارة الصحة المديرية العامة لشئون الصحة بمنطقة عسير ٦٠٠ / ٢٧٥</p>
الرقم : التاريخ : الموضوع :		
<p>To whom it may concern</p> <p>RE: Ali Ahmed A Alzahrani</p> <p><u>Sub: letter of approval</u></p>		
<p>This is to certify that Dr. Ali Ahmed A Alzahrani , a PhD student of University of Technology Sydney, is completely authorized and supported to conduct a data collection from stakeholders in our facilities and other collaborative facilities in the Saudi Arabia and other GCC countries for his study "Physical activity policies in Gulf Collaboration Council countries: A qualitative study with document analysis and stakeholder interviews".</p> <p>The Directorate General of Health Affairs in Asir is the administrative authority of public hospitals in the whole region. It is also one of the Ministry of Health directorate health affairs in the country.</p> <p>This document is issued upon the request of Alzahrani to confirm our agreement, collaboration and support for this study.</p> <p>If you have any further enquiries, please do not hesitate to contact us.</p>		
<p>Production Note: Signature removed prior to publication.</p> <p>Public and environmental health manager Dr. Ali Alqarni</p> 		
<p>E-mail: hpp.asir@gmail.com لتحميل سقايح صحة عسير : ٢٨٠٠</p>		

Kingdom of Saudi Arabia
Ministry of Health

Directorate of Health affairs - Assir Region
600 / 275



المملكة العربية السعودية
وزارة الصحة

المديرية العامة للشؤون الصحية بمنطقة عسير
٦٠٠ / ٢٧٥

الرقم : التاريخ : الموضوع : المشروعات :

To whom it may concern

RE: Ali Ahmed A Alzahrani

Sub: letter of approval

This is to certify that Dr. Ali Ahmed A Alzahrani , a PhD student of University of Technology Sydney, is completely authorized and supported to conduct a data collection from the Southern region of Saudi Arabia for his study " Policy, cultural, social and environmental barriers to physical activity in the Southern region of Saudi Arabia".

The Directorate General of Health Affairs in Asir is the administrative authority of public hospitals in the whole region. It is also one of the Ministry of Health directorate health affairs in the country.

This document is issued upon the request of Alzahrani to confirm our agreement, collaboration and support for this study.

If you have any further enquiries, please do not hesitate to contact us.

Production Note:
Signature removed prior to publication.

Public and environmental health manager

Dr. Ali Alqarni



Appendix 2: Ethics application for the first research phase project



Human Ethics Application

Application ID :	ETH21-6428
Application Title :	Physical activity policies in Gulf Cooperation Council countries: A qualitative study with document analysis and stakeholder interviews
Date of Submission :	
Primary Investigator :	Dr Klaus Gobel (Chief Investigator)
Other Personnel :	Mr Ali Ahmed A Alzahrani (SRResearch Student)

Section 1: Ethics Portal

Select your application type

What type of application are you looking for?
 Please do not change your application type without first consulting with the Ethics Secretariat (9514 9772).*

- New application (including scope-checking for nil/negligible risk research)
- Ratification of existing approval
- Transfer of existing approval
- Evaluation of teaching and learning activities
- Amendment to existing approval
- Program approval

You have selected "new application (including scope checking for nil/negligible risk research)". This option allows you to create a new form. The system will check if your application can be approved by the Faculty or whether it requires full ethics approval by the HREC. Please click "save" before continuing.

What should I know before I start?

Would you like more information on:

- This system
- The ethics process
- Purpose of the ethics review process

This system

The purpose of this online system is to streamline the ethics application process.

Mandatory questions in the application form are marked with a red asterisk (*) and must be answered before submitting this form. If a question is left unanswered on a page the form menu will show a red exclamation mark (!) on the left side of the page name and the question will be highlighted in pink.

The navigation menu allows you to view all sections and pages of the application, and also keeps track of what pages have been visited and/or completed and which pages are incomplete.

Action buttons (located on the right) shows the actions that the person viewing the form can make, and will differ between each role, e.g. student, supervisor, staff member, faculty member, HREC member, Research Ethics Officer, etc.

'Next page': Each time you click on the blue 'next page' button, your application is saved automatically.

Save: This button allows you to save the page before moving to other pages.

Comments: This allows you to make comments on the application.

Reports: Allows you to view or print a PDF the application form.

Section 1A: Risk evaluation

Risk A

Determining the level of risk and review

- Please answer each question carefully and **consecutively**.
- For assistance with answering these questions please refer to the [National Statement on Ethical Conduct in Human Research](#) as per the chapters listed below.
- If you need to contact the [Research Ethics Office](#) you can call (02) 9514 9772
- Click on the help buttons (?) for more information
- You can save your application at any time by clicking on the save button on the left hand side in the toolbar. For further information and help in completing your application go to [our website](#).

Does your research involves

Projects involving covert observation, active concealment, or planned deception of participants

e.g. covert observation of the hand-washing behaviour of hospital employees, undisclosed role-playing by a researcher, etc. Does NOT include observation in a public place WITHOUT the use of photographs, images, video or audio footage (Chapter 2.3, p.19)

- *
 - Yes
 - No

Targeted recruitment or analysis of data(?) from any of the groups listed below (or where any of these groups are likely to be significantly over-represented in the group being studied)

- Women who are pregnant and the human fetus (Chapter 4.1, p. 61)
- Children and young people (under 18 years) (Chapter 4.2, p. 65)
- People in dependent or unequal relationships (e.g. lecturer/student [except T&L], doctor/patient, employer/employee) (Chapter 4.3, p.68)
- People highly dependent on medical care who may be unable to give consent (Chapter 4.4, p.68)
- People with a cognitive impairment, an intellectual disability, or a mental illness (may include the disadvantaged/homeless) (Chapter 4.5, p. 70)
- People who may be involved in illegal activities (including those affected e.g. victims of domestic violence) (Chapter 4.6, p.71)
- Aboriginal and Torres Strait Islander Peoples (Chapter 4.7, p.72)

-
- Yes
- No

Targeted recruitment of people in / from countries that score <50 on the Corruption Perception Index (CPI) (check [here](#))

This includes any cohorts from these countries, i.e. it is not restricted to marginalised groups within these countries*

- Yes
- No

Collection, use or disclosure of personal information without consent of the participant(?)

- a record which may include your name, address and other details about the participant (e.g. date of birth, financial information etc.)
- photographs, images, videos or audio footage
- fingerprints, blood or DNA samples

-
- Yes
- No

Collection, use or disclosure of health information(?)

- personal information that is information or an opinion about
 - = the physical or mental health or a disability (at any time) of an individual, or
 - = an individual's expressed wishes about the future provision of health services to him or her, or
 - = a health service provided, or to be provided, to an individual or
- other personal information collected to provide, or in providing, a health service, or
- other personal information about an individual collected in connection with the donation, or intended donation, of a individual's body parts, organs, body substances, or
- other personal information that is genetic information about an individual arising from a health service provided to the individual in a form that is or could be predictive of the health (at any time) of the individual or of a genetic relative of the individual, or
- healthcare identifiers

N.B Includes information collected through physiological testing or assessment. Examples include but are not limited to EEG, EMG, BMI, blood pressure, CDVA, etc.*

- Yes
- No

Collection, use or disclosure of sensitive information

Racial, ethnic information, political, religious and philosophical beliefs, sexual activity or identity, and trade union membership

-
- Yes
- No

Activity that potentially infringes the privacy or professional reputation of participants, providers or organisations

e.g. observation in the workplace, collection of commercially confidential information, etc.
 Commercially confidential information – Any information which is not in the public domain or publicly available, and where disclosure may undermine the economic interest or competitive position of the owner of the information (IGA adopted definition from European Medicines Agency (EMA)).

N.B. If canvassing opinion via consensus methods i.e. Delphi (?), answer "No" here

-
- Yes
- No

Establishment of a register or databank of identifiable data for possible use in future research projects (Chapter 3.2, p.27) (?)

-
- Yes
- No

Collection, transfer(?) and/or banking of human biospecimens.

e.g. tissue, blood, urine, sputum etc.(?)

-
- Yes
- No

Any significant alteration to routine care or service provided to participants

e.g. deviation from standard care or usual practice

*

- Yes
- No

Prospective assignment of human participants or groups of humans to one or more [health-related interventions](#) to evaluate the effects on health outcomes(?) (Chapter 3.14-3.17) *

- Yes
- No

Potential for participants to experience harm (i.e. anything more than discomfort)(?)

e.g. physical, psychological, devaluation of personal worth, social, economic and/or legal (Chapter 2.1, p.12)

*

- Yes
- No

Risks B

For assistance with answering these questions please refer to the [National Statement on Ethical Conduct in Human Research](#) as per the chapters listed below.

Collection, use or disclosure of personal information (?) WITH consent of the participant

e.g. surveys, interviews, focus groups, publication.

N.B. if administering anonymous surveys and you have the participant's contact information, answer "Yes" here

N.B. if canvassing opinion via consensus methods i.e. Delphi (?), answer "No" here.

*

- Yes
- No

Involves direct communication or contact with participants (e.g. UTS staff/students, patients, consumers, professionals, industry partners or members of the public, etc.)

e.g. [interviews or focus groups, etc \(face-to-face, via phone, email, online etc.\)](#)

N.B. if canvassing opinion via consensus methods i.e. Delphi (?), answer "No" here.

*

- Yes
- No

Involves participants who have a pre-existing relationship with the researcher(s) and/or those involved with recruitment and/or consent

e.g. relative, friend, co-worker, lecturer/student [T&L].

N.B. if canvassing opinion via consensus methods i.e. Delphi (?), answer "No" here.

*

- Yes
- No

People unable to give free informed consent due to difficulties in understanding the Information Sheet or Consent Form.

e.g. language difficulties

*

- Yes
- No

People in other countries that score >50 on the Corruption Perception Index (CPI) (check [here](#))

Chapter 4.8, p.80

N.B. if canvassing opinion via consensus methods i.e. Delphi (?), answer "No" here.

*

- Yes
- No

Low Risk

Section 2: Project information

Project title

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

Application ID (automatically generated):

ETH21-6428

Application Title:*

Physical activity policies in Gulf Collaboration Council countries: A qualitative study with document analysis and stakeholder interviews

Please note that the HREC is now granting a standard approval period for the research proposals.

The approval period for your project will be specified in your approval letter. Please also note that research should not commence until ethics approval has been granted. The Committee cannot grant retrospective approval for data that has already been collected.

Ethics category code (automatically selected):*

Human

Is this a resubmission of a previous application?*

- Yes
- No

Is this a pilot study? *

- Yes
- No

Has a pilot study been conducted as part of this project? *

- Yes
- No

Please save and continue to the next page

Consultation

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

Have you undertaken any consultation in preparing this application?*

- Yes
- No

Please describe*

My supervisors and the Saudi embassy in Australia

Please save and continue to the next page

Section 3: Personnel

Investigators

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

Are there external investigators or personnel listed on this protocol?*

- Yes
- No

Is this application for a student project?⁹

- Yes
- No

Student applicants:

1. Please note that once your application is submitted it will go directly to your supervisor and not to the Committee.
2. We **strongly** recommend notifying your supervisor that you have submitted your application in case of any technical issues, to avoid potential delays in the review process.
3. Once your supervisor endorses your application it will go to your Local Research Office for endorsement before coming to the Ethics Secretariat for review.
4. Your electronic application must be endorsed by your supervisor by the [Local Research Office \(LRO\) submission deadline](#).
5. Please also ensure that the Primary AOU at the end of this page is updated to your supervisor's AOU. This will show in the table under 'Internal personnel listed below', once you add them. If you need any assistance with this please contact Research.Ethics@uts.edu.au or call 9514 9772. Please note that this is particularly important if you have a dual role as a staff/student as your application could go to the wrong faculty for review through the automated process.

Positions in the personnel table

Position types:	In the personnel table use the following positions from the drop-down list:
Chief Investigator/Supervisor	1Chief Investigator (students must not be listed as Chief Investigator)
Co Investigator	3Assoc. Investigator
Co supervisor	Co-supervisor
Research Student	5Research Student
Project Administrator	7Project Administrator

Notes: Further options are available in the drop-down list.

Instructions on how to add a person to the personnel table:

1. Click on "Add"
 2. Start typing the details (first name, last name or Staff ID) in the search bar.
 3. Click on "Add selected"
 4. The extra information panel will open, select their position from the drop-down list. If they are the primary contact (e.g. Chief Investigator/Supervisor), tick "Yes" under "Primary contact" and then select "OK"
- **Student research:** Students must add their supervisors to their application and must mark their primary supervisor as a Chief Investigator and as a primary contact. Students must be listed as "5Research student" under the column 'Position' to ensure the application is properly submitted to their supervisor.
 - **Ratifications/Transfers:** If this list differs from that of the original application, you must provide evidence that any additional investigators have been added via amendment to the lead/external HREC (attach relevant amendments and evidence of approval).

Internal personnel listed on this ethics protocol:⁹

1	Primary	No
	ID	
	Surname	Alzahrani
	Given Name	Ali Ahmed A
	Full Name	Mr Ali Ahmed A Alzahrani
	Position	5Research Student
	Type	International
	AOU	FoH School of Public Health
	Managing Unit	Faculty of Health
	Email Address	AlAhmedA.Alzahrani@student.uts.edu.au
	Work Number	
2	Primary	Yes
	ID	
	Surname	Gebel
	Given Name	Klaus
	Full Name	Dr Klaus Gebel
	Position	Chief Investigator
	Type	Internal
	AOU	FoH School of Public Health
	Managing Unit	Faculty of Health
	Email Address	Klaus.Gebel@uts.edu.au
	Work Number	+61 2 95144578

If any details are incorrect or missing please contact the Ethics Secretariat on (02) 9514 9772 or by [email](mailto:ethics@uts.edu.au).

Please provide additional (or preferred) contact details of any of the people listed on the project if necessary (4000 character limit)

This question is not answered.

Please provide details of any formal qualifications ([REF NS 1.1\(e\)](#)) of each person listed on the project (4000 character limit)*

1- Doctor Klaus Gebel
Doctor of Philosophy

2- Doctor Ali Abahani
Bachelor of Medicine and Bachelor of Surgery (MBBS), Master of Public Health (MPH), Doctor of Philosophy candidate.

Please outline the experience of each person listed on this project relevant to this application (4000 character limit)*

Doctor Klaus Gebel is a Senior Lecturer in Public Health. He is also an Adjunct Senior Research Fellow at the Sydney School of Public Health of the University of Sydney. He has master's degrees in exercise science from the German Sport University Cologne and Victoria University, Melbourne, where he first specialised on exercise for rehabilitation and then on physical activity and public health. He did his Ph.D. at the School of Public Health of the University of Sydney. His main research areas are the relationship between built environments, physical activity, and health and the health effects of physical activity. He has published more than 50 peer reviewed journals articles, book chapters and reports and one book. As well, he has peer reviewed more than 100 articles for 56 journals and many abstracts for several conferences.

Doctor Ali Abahani is a registered medical doctor in the Saudi Commission for Health Specialties as a Public Health resident. He has a master's degree in Public Health from the University of Technology Sydney. Currently, he is a Ph. D. student at the Faculty of Health, University of Technology Sydney.

Primary ADU*

PHU, School of Public Health

Managing Unit

Faculty of Health

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Student details

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#)

Degree being undertaken (500 character limit)*

Doctor of Philosophy (Ph. D.) in Public Health

Have you been successful in your doctoral/masters assessment? *

- Yes
- No

Please indicate why you are applying for ethics approval at this stage, and when you will be seeking assessment or re-assessment? (4000 character limit)*

This proposed study is a part of my PhD thesis and will be my first paper, which is a qualitative study that needs UTS ethics approval.

Students, please read carefully: Once you have completed this application and followed the submission instructions, your application will go to your supervisor for review. Once your supervisor has reviewed and endorsed your application it will come to the Ethics Secretariat for a pre-review. This pre-review process helps ensure that your application is complete, has all necessary attachments, and that the quality of responses to the questions meets the Committee's expectations. Your application should therefore be submitted as early as possible. If you do not submit your application in time, it may be delayed and held off until the next closing date.

Section 4: Funding and Disclosure of interests

Funding details

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#)

Have you received funding in relation to this research?*

- Yes
- No

Do you have a RM 'My Proposals' ID number?*

- Yes
- No

List the source of funding (e.g. funding body / type)

(REF: KS Page 8 "When is ethical review needed?", 2.2.6(h), 3.3.5(a), 3.3.18(b), 4.8.6, 5.2.7, and 5.7) (2000 character limit)*

A scholarship from the Ministry of Health (MOH), Saudi Arabia
Ph. D. funding from the Faculty of Health, UTS

Total amount of funding obtained, including in-kind contribution (please indicate which is applicable)

\$3000.00, which is provided by the Faculty of Health, UTS

What is your relationship to the funding source? (e.g. grant recipient, industry partner, contractor, employee, office-bearer, personal, other)*

I am an employee of the Ministry of Health, Saudi Arabia, which is the official funding source for my scholarship.

Are there any constraints on the research as a result of the funding arrangements, e.g. to intellectual property, publication, etc? (Section 4, The code)*

- Yes
- No

Please save and continue to the next page

Disclosure of Interests

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#)

Do any members of the research team (including persons not listed in this application), have any financial or non-financial interests related to this research?*

- Yes
- No

Please save and continue to the next page

Section 5: Methodology

Description

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#)

The purpose of this section is to place your research in context for the HREC and demonstrate your ability to conduct the research. The HREC may only approve research which is methodologically sound. Remember to use simple language that can be understood by people from a variety of backgrounds. Avoid jargon and acronyms.

What are the hypotheses/goals/aims/objectives of your research? Please include a brief description using plain English explaining your research aims (approximately 100 words) (4000 character limit)*

The aim of this research is to analyse physical activity policies in the Gulf Cooperation Council countries (Saudi Arabia, UAE, Qatar, Bahrain, Kuwait, and Oman) and to provide suggestions for the optimal delivery of PA policies in these countries.

Note: Clinical Trials, Recruitment of Participants and Data Collection are dealt with later in the application so you do not need to describe them in detail below

Please provide a brief description of the research design including research questions and proposed methods for conducting the research (approximately 250 words) (4000 character limit)*

The main questions for this study are: 1- What national physical activity policies/plans are in place in the Gulf countries? 2- What are the contents of the national physical activity policies/plans in each GCC country? 3- What are the opinions/ perspectives of the stakeholders regarding these policies? This study is qualitative research. The first step was to identify the PA policy documents in the GCC countries by searching the literature and governmental websites. 2- The PA policy documents will be analysed by me, my supervisor and the other co-authors. 3-The third step is to conduct semi-structured interviews with key stakeholders such as members of sport and health ministries. The interviews will examine their perception of the environment, initiatives, strengths, weaknesses, and existing policy barriers. 3- After that, we compare what they said against what we found.

What do you hope the outcome(s) of this research will be? (4000 character limit)*

1. To identify and analyse the PA policies in the Gulf Cooperation Council (GCC) countries.
2- To investigate the opinions and perceptions of the stakeholders towards the PA policies.
3- To explain the barriers and challenges for improvement and sustainability of the PA policies in the GCC countries.

Who do you think will benefit from this research? (4000 character limit)*

University of Technology Sydney, PA policy stakeholders, and the community of GCC countries.

Please provide a brief description of the significance of your research (approximately 100 words) (4000 character limit)*

The proposed research study will have a significant contribution to the field of public health, in particular, the promotion of physical activity, as it will be the first evaluation of PA policies in Saudi Arabia and other GCC countries. Furthermore, based on the research findings, I will develop some suggestions for the PA stakeholders in the GCC countries to improve the delivery of PA policies.

Please save and continue to the next page

Literature review & references

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

Please give a brief literature review. The aim is to explain how your research fits into the context of other research in the area (REF NS 1.1(c)) (4000 character limit with spaces)
Please note that you cannot paste links into the online form

Globally, non-communicable diseases (NCDs) affect the lives of over 40 million people per year, 15 million of whom die prematurely. Physical inactivity and sedentary lifestyle are among the risk factors of non-communicable diseases (Lee et al. 2012). In the Gulf region, 45% of the burden of diseases is due to NCDs. By 2021, this burden is expected to increase to 60% (WHO,2021). Pogrmilovic et al. (2018) conducted a global scoping review of the content of national-level physical activity and sedentary behavior policies. One of the limitations of their study is the lack of in-depth analysis of the studies and national policies in the Mediterranean region, including the Gulf region.

The International Society for Physical Activity and Health (ISPAH) has published an evidence-based overview of the following eight investments for promoting physical activity: whole-of-school programs, active transport, active urban design, healthcare, public education including mass media, sport and recreation for all, workplaces, and community-wide programmes (ISPAH, 2020). The proposed study will discuss three of these investments which based on cultural, climatic and environmental conditions are the most suitable in the Gulf region: Health, Sport and Education.

In this study, I will analyze policy documents, national strategic plans, and governmental reports in terms of physical activity in the Gulf countries.

Please list the references only used in the literature review and cited in your application
NOTE: Do not include references you have not used in this application (4000 character limit)

- 1- International Society for Physical Activity and Health (ISPAH). ISPAH's Eight Investments That Work for Physical Activity. November 2020: www.ispah.org/resources.
- 2- World Health Organization. Non-communicable diseases. [<http://www.who.int/mediacentre/factsheets/fs355/en/>]. Viewed 2 august 2021.
- 3- Klopac Pogrmilovic, B., et al. (2018). A global systematic scoping review of studies analysing indicators, development, and content of national-level physical activity and sedentary behaviour policies. International Journal of Behavioral Nutrition and Physical Activity 15(1): 123.
- 4- Lee, I. M., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., Katzmarzyk, P. T., & Lancet Physical Activity Series Working Group. (2012). Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. The Lancet, 380(9838), 219-229.

Please save and continue to the next page

Methods and methodologies

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

In order to consider your research, the HREC will need to know what it will involve for your participants (REF NS 3.1)

What kinds of methods and methodologies will you use in your research? (More than one box may be checked)*

- Quantitative
- Qualitative

Does your research involve collection and/or use of secondary data? (e.g. existing / routinely collected data etc.)*

- Yes
- No

Please provide a description of the secondary data source(s) below*

Physical activity policy documents in the GCC countries. These documents will be identified by desk research through the official government websites, for example, The Ministry of Health, Sport and Education websites. Therefore, it is will be publically available and no need for permission to access these data. In our study, we are focusing on the published documents that contain applicable active policies.

Please save and continue to the next page

Qualitative

28/09/2021

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We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

What **qualitative** methodology and methods will be using in this research?

Section 1: Qualitative methodology*

- Auto-ethnography
- Historical research
- Other *(Please describe below)
- Action research
- Narrative enquiry
- Biographical research
- Case study
- Phenomenology
- Indigenous research paradigm
- Discourse analysis
- Grounded theory

Section 2: Qualitative methods*

- Participants observation
- Covert observation
- Life-story or oral history
- Focus groups
- Structured interviews
- Semi-structured interviews
- Unstructured interviews
- Other *(Please describe below)
- On-line research
- Psychological testing/assessment
- Verbal protocol
- Journaling
- Artifact analysis
- Document/Policy analysis
- Access to records
- Audio/video recording

Please describe how interviews will be conducted, including how many participants will be involved (from each participant group if there is more than one group/cohort), the amount of time required of participants for this, whether it will be recorded, and any other information applicable (4000 character limit)*

I am planning to conduct semi-structured interviews with stakeholders from three ministries (Health, Education and Sport) in Saudi Arabia and the other GCC countries. Data saturation or theme saturation is the main goal of qualitative studies. Therefore, we expect that interviews with four to six participants from each ministry will be sufficient. The interviews will take from 45 to 60 minutes because most of the stakeholders will be policymakers in their field and will be busy. However, we are examining the perspective and opinions of stakeholders regarding the PA policy documents. So, I think that 45 to 60 minutes will be sufficient. The interviews will be conducted via telephone or Zoom and will be only audio-recorded. Personal information will be collected from participants such as (name, organization, and position). To avoid any cost of international phone calls, I will use Zoom. The Arabic language will be used, and transcripts will be translated to English. I and my supervisor will transcribe the interviews. The participants will be provided with the opportunity to review the transcripts for accuracy.

Please save and continue to the next page

Section 6: Research participants/subjects part 1

Participant involvement

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

What time commitment will the research involve for your participants?

NOTE: This information must be included in any information to participants
(4000 character limit)*

The study participants would only need to give around 15 minutes of their time for the semi-structured interview.

In what location will the research/data collection take place?

NOTE: This information must be included in any information to participants
(4000 character limit)*

Saudi Arabia and other GCC countries (Oman, UAE, Bahrain, Qatar or Kuwait)

What travel, if any, does the research involve for your participants?

NOTE: This information must be included in any information to participants
(4000 character limit)*

They will not be involved in any travel.

Please include any additional information relating to participants that you think relevant
NOTE: This information must be included in any information to participants
 (4000 character limit)*

The proposed research will not involve any expenses for the participant.

Describe and justify any benefit, payment or compensation the participants will receive. For research being conducted with Aboriginal and Torres Strait Islander People, the described benefits from research should have been discussed with and agreed to by the Aboriginal or Torres Strait Islander research stakeholders. (REF NS 2.1) and 4.7.8 & 4.7.9)
 (4000 character limit)*

Participation in this research will be voluntary so, there will be no payment or compensation for the participants.

Please save and continue to the next page

Recruitment of participants

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

In line with the National Statement, the definition of participants includes not only those humans who are the primary focus of the research but also those who will be affected by the research. The HREC regards the principle of respect for persons as of paramount importance. (REF NS 1.1 (d), 1.6-1.9, 1.10, 2.1).

How will you initially select and contact your participants? More than one box may be checked, if appropriate*

- Advertisement/flyer
- E-mail
- Telephone
- Internet
- Organisation
- Personal contact
- Letter
- Other contact method to be used

Please describe what other method you will use for recruitment*

Zoom will be used to avoid international fees.

Outline how you will obtain participants' contact details*

The participants' contact details will be obtained from the organisation by sending an e-mail to them. The email will include an introduction to the research and a request to identify stakeholders in the organisation (Health, Sport, Education ministries). Since the Saudi Ministry of Health has many collaborations with different ministries nationally and internationally, The letter of approval from the Saudi Ministry of Health will be presented to the organisation to facilitate obtaining contact details for key stakeholders regarding physical activity promotion.

Please describe your recruitment plan/strategy*

After obtaining the contact details of key stakeholders from the organisations (Health, Sport and Education), the participants will be contacted directly via e-mail or telephone. I will invite and explain the aims of our study to them. The participant will be asked to sign the consent form via email before the interview. To include more participants, the participant will be asked, after finishing the interview, if he can provide contact details for another stakeholder in the same organisation.

How many participants do you intend to recruit? (If you are intending to recruit different groups of participants, please answer all relevant questions for each group, e.g. control group, test group, etc)
 (4000 character limit)*

Data saturation or theme saturation is the main goal of qualitative studies. Therefore, four to six participants from each ministry will be expected to be sufficient. If the data saturation was not achieved, we could interview more participants.

Explain how and why you have chosen this number. If the research is quantitative, explain the power calculations; if the research is qualitative, explain why the proposed number is likely to result in adequate data based on evidence/literature. For guidance, check our [Fact Sheets](#)*

Data saturation or theme saturation is the main goal of qualitative studies. Therefore, four to six participants from each ministry will be expected to be sufficient. Fusch and Ness stated that data saturation is reached when there is enough information to replicate the study when the ability to obtain additional new information has been attained, and when further coding is no longer feasible. Furthermore, Allender et al.,2012 recruited 11 key informants from the local government in Victoria, Australia. So, up to 18 participants (4-6 participants from each ministry) would be sufficient to achieve our goals.

Allender, S., Gleeson, E., Crammond, B., Sacks, G., Lawrence, M., Peeters, A., ... & Swinburn, B. (2012). Policy change to create supportive environments for physical activity and healthy eating: which options are the most realistic for local government?. *Health promotion international, 27*(2), 261-274.

Fusch, P. J., & Ness, L. R. (2015). Are we there yet? Data saturation in qualitative research. *The qualitative report, 20*(9), 1408.

Describe your inclusion and exclusion criteria for participants*

This study will target individuals who have direct and substantial contributions to the development, implementation, and management of physical activity policy in GCC countries. The policymakers in the three ministries (Health, Sport, Education) will be invited to my proposed study. Based on the response from the three ministries via e-mail, the participants will be included. Physical activity policymakers such as sports managers, public health department managers, medical doctors, and Physical education department managers are expected to be included. On the other hand, anyone who is not directly involved in the PA policy process will be excluded.

Please save and continue to the next page

Consent

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

Will you be obtaining written consent?*

- Yes
- No

Please provide sample documents in attachments list at the end of the application form. Please use the following HREC templates when creating an information sheet and consent form: [HREC templates](#)

Do you believe there will be any special issues relating to consent in your research? (REF NS 1.11, 2.2, 2.3, Chapter 4)*

- Yes
- No

Are the participants able to consent fully? (REF NS Chapter 2: 4.4, 4.5)*

- Yes
- No

Please save and continue to the next page

Limited disclosure

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

Does this research involve limited disclosure to participants? (REF NS 2.3)*

- Yes
- No

Please save and continue to the next page

Ethical considerations specific to participants

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

Indicate if your research will involve the following populations (as per the National Statement) other than as incidental participants (i.e. they are not included in the design of the project but may be participants) (REF NS Chapter 4)

- Women who are pregnant and the human foetus
- Children and young people
- People in dependent or unequal relationships
- People highly dependent upon medical care who may be unable to give consent
- People with a cognitive impairment, an intellectual disability or a mental illness
- People who may be involved in illegal activities
- People who are incarcerated
- Aboriginal and Torres Strait Islander Peoples
- People in other countries
- None of the above

If your research is being conducted in Australia, does it involve Culturally and Linguistically Diverse (CALD) People (other than incidentally)?*

- Yes
- No

Does your research involve Defence or the Department of Veteran Affairs in any way?*

- Yes
- No

Please save and continue to the next page

Section 7: Research participants/subjects part 2

Risk/harm

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

Risk or harm could be described as damage or hurt to the wellbeing, interests or welfare of an individual, institution or group. Harm could range from physical hurt or damage such as illness or injury, to psychological or emotional hurt or damage, such as embarrassment or distress. Please note that as a researcher, you are not necessarily immune from risk yourself and should give careful consideration to this question (REF NS 2.1).

NOTE:

It is **really** important that you carefully consider all **potential** risks that could occur, even if they seem negligible.

Please **do not** provide one-word answers to any of the questions below.

Describe, as best as you can, any possible risks to research participants, subjects and related groups

NOTE: This information must be included in any information to participants (4000 character limit)*

This research will be involving policy documents analysis and semi-structured interviews with stakeholders. Therefore, minimal risks would be expected. For example, the participants may be interrupted by background during telephone or Zoom interviews. In this case, they will be offered to postpone the interviews to a suitable time. Another example, interviews with female participants could be a cultural risk. So, I will clarify that the official governmental telephone number will be used in contact and not the personal mobile number. On the other hand, I will clarify that the meeting will be only audio recorded in the case of using Zoom meetings.

How would you categorise the magnitude of potential risk? (e.g. inconvenience, discomfort, harmful, painful)

Explain why you believe this is so (4000 character limit)*

inconvenience would be expected.

How would you categorise the likelihood of risk? (i.e. slight, possible, likely, probable, unavoidable)

Explain why you believe this is so (4000 characters)*

The proposed research would cause a slight risk.

What strategies will you use to minimise and/or manage the risks? (4000 character limit)*

This research will be involving policy documents analysis and semi-structured interviews with stakeholders. Therefore, minimal risks would be expected. For example, the participants may be interrupted by background during telephone or Zoom interviews. In this case, they will be offered to postpone the interviews to a suitable time. Another example, interviews with female participants could be a cultural risk. So, I will clarify that the official governmental telephone number will be used in contact and not the personal mobile number. On the other hand, I will clarify that the meeting will be only audio recorded in the case of using Zoom meetings.

Discuss likely or possible risk to researchers (including yourself), and your strategies for minimising such risks (4000 character limit)*

When conducting this study, there will be no predicted risks for the researcher.

Please save and continue to the next page

Pre-existing relationships

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

Are there likely to be any pre-existing relationships with research participants? (e.g. employer/employee, colleague, friend, relation, student/teacher, etc) (REF NS 3.3)*

- Yes
- No

Please describe (4000 character limit)*

In this context, the challenge of getting these people to participate in this research is really difficult. So, my connections and relationships are absolutely critical in ensuring to get participation, but for the purpose of this research, this is how I will get the best.

How might these relationships influence their decision to participate, be affected by the proposed research or create potential ethical conflict? Please describe strategy for dealing with this (4000 character limit)*

In this context, the challenge of getting these people to participate in this research is really difficult. So, my connections and relationships are absolutely critical in ensuring to get participation, but for the purpose of this research, this is how I will get the best.

Describe how you will ensure that student assessment, employee security, etc., will not be adversely affected by participation in this research (4000 character limit)*

N.A.

Will you be recruiting UTS staff and/or students as research participants?*

- Yes
- No

Please save and continue to the next page

External organisations

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

Indicate if your research will involve any of the following:*

- Institution
- Organisation
- Community Group
- None of the above

Please save and continue to the next page

Section 8: Data

Data collection & use

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

Does your research involve access to student records at this University?*

- Yes
- No

Provide an analysis plan outlining how the aims/objectives will be met, the statistical methods to be used, and who will be carrying out the analysis. *

In my proposed study, my supervisor and I will follow the thematic analysis approach phases. We will collect, clean, organise and manage all data. We will also transcribe interviews. Raw data after translation to English will be imported to NVIVO, a program for qualitative data analysis. The purpose of using NVIVO is to obtain themes and sub-themes from transcribed interviews.

Describe any foreseeable future use of this data; such as sharing with other researchers, secondary use for related research, publishing for unrelated research and non-research purposes and any other possible uses. Please note this information must be included in the participant information sheet. *

There will be no sharing of data with other researchers except my supervisor and the co-authors. After ensuring the anonymity of participants, the results and recommendations of our study could be shared with the funding body or the ministries to improve physical activity promotion in the country. However, this proposed study will be the first part of my PhD thesis, we intend to publish our results in a peer-reviewed journal.

Regarding privacy and confidentiality, I will tell the participants before the interviews that we are committed to treating all information confidentially. They will be asked before interviews (Have you read the consent form? Do you have any questions about what to do? Do you consent to participate in this research?). The participant information will not be shared with any organization or persons except UTS and the researchers. Since the interviews will be conducted by telephone or Zoom Audio not involving video, privacy is expected to be achieved.

Do you have a research data management plan?*

- Yes
- No

Please save and continue to the next page

Section 9: Additional information

Other ethical issues

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

If there are any additional ethical issues which you do not believe have been covered by this form, please explain them for the HREC: (4000 character limit)*

There are no expected ethical issues.

Please save and continue to the next page

Section 10: Attachments

Attachments

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

I have attached the following supporting documents

Budget page from funding application*

- Yes
 N/A

Participant Information Sheet(s)*

- Yes
 No

Informed consent form(s)*

- Yes
 N/A

Explanations of any technical terms used *

- Yes
 N/A

Research data management plan (RDMP)*

- Yes
 No

Standard Operating Procedures

N.B. May include a [distress](#) or disclosure protocol [see [UTS HREC Disclosure Guidelines](#) under University policies and guidelines], [Faculty of Health - Low Risk protocol](#); procedures for participant screening, physiological, or biological sampling and/or laboratory or safety procedures where relevant.

- *
 Yes
 No

Please explain why any of the above items have not been attached (either softcopy/hardcopy) and when they will be provided (4000 character limit)*

Standard Operating Procedures is not applicable.

Documents attached to this application:

How to attach documents

1. Click on 'Add'
Ensure the fields are as follows:
 - o Document type- soft copy
 - o Name: Include the document name and version number
 - o Description: This field is optional
2. You can then either select the file you want to upload OR drag and drop it where it says 'Drop file here'
3. Click on 'OK'

Note: Please use the following HREC templates when creating an information sheet, consent form, verbal script, etc.: [HREC templates](#). All submitted documents should be titled, and have version control included in the footer.*

1	Document type	Soft copy
	Name	Financial guarantee - Saudi Arabia
	Reference (Document Title)	financial guarantee.pdf
	Description	
2	Document type	Soft copy
	Name	Participant information sheet-consent form
	Reference (Document Title)	Participant information sheet-consent form - ALL_KG.pdf
	Description	
3	Document type	Soft copy
	Name	RDMP
	Reference (Document Title)	rdmp (2).pdf
	Description	Research data management plan (RDMP)
4	Document type	Soft copy
	Name	letter of approval - Saudi Ministry of Health
	Reference (Document Title)	letter of approval.pdf
	Description	
5	Document type	Soft copy
	Name	consent form Arabic
	Reference (Document Title)	consent form- Arabic.pdf
	Description	
6	Document type	Soft copy
	Name	The interview questions
	Reference (Document Title)	Interviews questions PA policy stakeholders in Saudi Arabia.docx
	Description	The interview questions of the study (Physical activity policies in Gulf Collaboration Council countries: A qualitative study with document analysis and stakeholder interviews)
7	Document type	Soft copy
	Name	Faculty of Health Low Risk Ethics Panel Outcome and Comments
	Reference (Document Title)	ETH21-6426 Faculty of Health Low Risk Ethics Panel Outcome and Comments.docx
	Description	

Reminder to student applicants:

1. Please note that once your application is submitted it will go directly to your supervisor and not to the Committee.
2. We **strongly** recommend notifying your supervisor that you have submitted your application in case of any technical issues, to avoid potential delays in the review process.
3. Once your supervisor endorses your application it will go to your Local Research Office for endorsement before coming to the Ethics Secretariat for review.
4. Your electronic application must be endorsed by your supervisor by the [Local Research Office \(LRO\) submission deadline](#).
5. Please also ensure that the Primary AOU listed at the end of the Investigators page is updated to your supervisor's AOU. This will show in the table under 'Internal personnel listed below', once you add them. If you need any assistance with this please contact Research.Ethics@uts.edu.au or call 9514 9772. Please note that this is particularly important if you have a dual role as a staff/student as your application could go to the wrong faculty for review through the automated process.

Declaration

Declaration

I have answered all questions in the risk assessment truly and completely to the best of my knowledge

I will notify the UTS Human Research Ethics Committee of any variation to this research that may alter the level of risk associated with it

This research will be undertaken in compliance with the UTS Research Ethics and Integrity Policy or any replacement or amendment thereof

This research will be undertaken in compliance with the Australian Code for the Responsible Conduct of Research and National Statement on Ethical Conduct in Human Research

Please click on the "Submit" button in the Actions menu.

Appendix 3: Ethical approval for study 1

Dear Applicant,

Re: ETH21-6428 - "Physical activity policies in Gulf Collaboration Council countries: A qualitative study with document analysis and stakeholder interviews"

Your local research office has reviewed your application and agreed that it now meets the requirements of the National Statement on Ethical Conduct in Human

Research (2007) and has been approved on that basis. You are therefore authorised to commence activities as outlined in your application, subject to any conditions detailed in this document.

You are reminded that this letter constitutes ethics approval only. This research project must also be undertaken in accordance with all UTS policies and guidelines including the Research Management Policy.

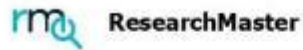
Your approval number is UTS HREC REF NO. ETH21-6428

Approval will be for a period of five (5) years from the date of this correspondence subject to the submission of annual progress reports.

The following standard conditions apply to your approval:

- Your approval number must be included in all participant material and advertisements. Any advertisements on Staff Connect without an approval number will be removed.
- The Principal Investigator will immediately report anything that might warrant review of ethical approval of the project to the [Ethics Secretariat](#).
- The Principal Investigator will notify the Committee of any event that requires a modification

Appendix 4: Ethics application for study 3



Ethics Application

Application ID :	ETH22-7510
Application Title :	Barriers to physical activity in the Southern region of Saudi Arabia - Mixed methods study
Date of Submission :	
Primary Investigator :	Dr Klaus Gebel (Chief Investigator)
Other Personnel :	Mr Ali Ahmed A Alzahrani (SResearch Student) A/Prof Anne Grunseit (Co-Supervisor)

Section 1: Ethics Portal

Select your application type

What type of application are you looking for?
 Please do not change your application type without first consulting with the Ethics Secretariat (9514 9772).*

- New application (including scope checking for nil/negligible risk research)
- Ratification of existing approval
- Transfer of existing approval
- Evaluation of teaching and learning activities
- Amendment to existing approval
- Program approval

You have selected "new application (including scope checking for nil/negligible risk research)". This option allows you to create a new form. The system will check if your application can be approved by the Faculty or whether it requires full ethics approval by the HREC. Please click "save" before continuing.

What should I know before I start?

Would you like more information on:

- This system
- The ethics process
- Purpose of the ethics review process

The ethics process

This form has a risk assessment which will help decide whether your research is nil/negligible risk or whether you will need to complete a full ethics application form. If you are unsure how to answer these questions or disagree with the outcome you can contact us by phone (02) 9514 9772 or by email the [Ethics Secretariat](#).

Staff applications: If your research is nil/negligible risk, you will receive an email after submitting this form which will confirm this. If your research is low or high risk, it will be submitted automatically to your local research office after you click on Submit.

Student applications: Your application will first be reviewed by your supervisor. If your research is nil/negligible risk, you will receive an email after your supervisor has endorsed the application. If your research is low or high risk, it will be submitted automatically to your local research office after your supervisor has endorsed your application online.

For more information, go to our [website](#).

What you should read when completing this form

This form should be read in conjunction with the relevant [University policies and guidelines](#), the [National Statement on Ethical Conduct in Research Involving Humans \(PDF, 652kb\)](#) and the [Australian Code for the Responsible Conduct of Research \(2007\) \(PDF, 829kb\)](#).

Section 1A: Risk evaluation

Risk A

Determining the level of risk and review

- Please answer each question carefully **and consecutively**.
- For assistance with answering these questions please refer to the [National Statement on Ethical Conduct in Human Research](#) as per the chapters listed below.
- If you need to contact the [Research Ethics Officer](#) you can call (02) 9514 9772
- Click on the help buttons (?) for more information
- You can save your application at any time by clicking on the save button on the left hand side in the toolbar. For further information and help in completing your application go to [our website](#).

Does your research involve:

Projects involving covert observation, active concealment, or planned deception of participants

e.g. covert observation of the hand washing behaviour of hospital employees, undisclosed role playing by a researcher, etc. Does NOT include observation in a public place WITHOUT the use of photographs, images, video or audio footage (Chapter 2.3, p.19)

- Yes
- No

Targeted recruitment or analysis of data(?) from any of the groups listed below (or where any of these groups are likely to be significantly over-represented in the group being studied)

- Women who are pregnant and the human fetus (Chapter 4.1, p. 61)
- Children and young people (under 18 years) (Chapter 4.2, p. 65)
- People in dependent or unequal relationships (e.g. lecturer/student [except T&L], doctor/patient, employer/employee) (Chapter 4.3, p.66)
- People highly dependent on medical care who may be unable to give consent (Chapter 4.4, p.68)
- People with a cognitive impairment, an intellectual disability, or a mental illness (may include the disadvantaged/homeless) (Chapter 4.5, p. 70)
- People who may be involved in illegal activities (including those affected e.g. victims of domestic violence) (Chapter 4.6, p.73)
- Aboriginal and Torres Strait Islander Peoples (Chapter 4.7, p.77)

*

- Yes
 No

Targeted recruitment of people in / from countries that score <50 on the Corruption Perception Index (CPI) (check [here](#))

This includes any cohorts from these countries, i.e. it is not restricted to marginalised groups within these countries*

- Yes
 No

Collection, use or disclosure of personal information without consent of the participant(?)

- a record which may include your name, address and other details about the participant (e.g. date of birth, financial information etc.)
- photographs, images, video or audio footage
- fingerprints, blood or DNA samples

*

- Yes
 No

Collection, use or disclosure of health information(?)

- personal information that is information or an opinion about
 - = the physical or mental health or a disability (at any time) of an individual; or
 - = an individual's expressed wishes about the future provision of health services to him or her; or
 - = a health service provided, or to be provided, to an individual or
- other personal information collected to provide, or in providing, a health service, or
- other personal information about an individual collected in connection with the donation, or intended donation, of a individual's body parts, organs, body substances, or
- other personal information that is genetic information about an individual arising from a health service provided to the individual in a form that is or could be predictive of the health (at any time) of the individual or of a genetic relative of the individual, or
- healthcare identifiers

N.B Includes information collected through physiological testing or assessment. Examples include but are not limited to EEG, EMG, BMI, blood pressure, DEXA, etc.*

- Yes
 No

Collection, use or disclosure of sensitive information

Racial, ethnic information, political, religious and philosophical beliefs, sexual activity or identity, and trade union membership

*

- Yes
 No

Activity that potentially infringes the privacy or professional reputation of participants, providers or organisations:

e.g. observation in the workplace, collection of commercially confidential information, etc.
 Commercially confidential information – Any information which is not in the public domain or publicly available, and where disclosure may undermine the economic interest or competitive position of the owner of the information (TGA adopted definition from European Medicines Agency (EMA)).

N.B. If canvassing opinion via consensus methods i.e. Delphi (?), answer "No" here

*

- Yes
 No

Establishment of a register or databank of identifiable data for possible use in future research projects (Chapter 3.2, p.27) (?)

*

- Yes
 No

Collection, transfer(?) and/or banking of human biospecimens.

e.g. tissue, blood, urine, sputum etc.(?)

*

- Yes
 No

Any significant alteration to routine care or service provided to participants

e.g. deviation from standard care or usual practice

*

- Yes
 No

Prospective assignment of human participants or groups of humans to one or more [health-related interventions](#) to evaluate the effects on health outcomes(?) (Chapter 3.14-3.17) *

- Yes
 No

Potential for participants to experience harm (i.e. anything more than discomfort)(?)

e.g. physical, psychological, devaluation of personal worth, social, economic and/or legal (Chapter 2.1, p.12)

*

- Yes
 No

Risks B

For assistance with answering these questions please refer to the [National Statement on Ethical Conduct in Human Research](#) as per the chapters listed below.

Collection, use or disclosure of personal information (?) WITH consent of the participant

e.g. surveys, interviews, focus groups, publication, etc.

N.B. If administering anonymous surveys and you have the participant's contact information, answer "Yes" here.

N.B. If canvassing opinion via consensus methods i.e. Delphi (?), answer "No" here

*

- Yes
 No

Involves direct communication or contact with participants (e.g. UTS staff/students, patients, consumers, professionals, industry partners or members of the public, etc.)

e.g. interviews or focus groups, etc (face-to-face, via phone, email, online etc.)

N.B. If canvassing opinion via consensus methods i.e. Delphi (?), answer "No" here

*

- Yes
 No

Involves participants who have a pre-existing relationship with the researcher(s) and/or those involved with recruitment and/or consent

e.g. relative, friend, co-worker, lecturer/student [T.M.].

N.B. If canvassing opinion via consensus methods i.e. Delphi (?), answer "No" here

*

- Yes
 No

People unable to give free informed consent due to difficulties in understanding the Information Sheet or Consent Form.

e.g. language difficulties

*

- Yes
 No

People in other countries that score >50 on the Corruption Perception Index (CPI) (check [here](#))

Chapter 4.8, p.80

N.B. If canvassing opinion via consensus methods i.e. Delphi (?), answer "No" here

*

- Yes
 No

Low Risk

Section 2: Project information

Project title

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

Application ID (automatically generated):

ETH22-7510

Application Title:*

Barriers to physical activity in the Southern region of Saudi Arabia - Mixed methods study

Please note that the HREC is now granting a standard approval period for the research proposals.
The approval period for your project will be specified in your approval letter.
Please also note that research should not commence until ethics approval has been granted. The Committee cannot grant retrospective approval for data that has already been collected.

Ethics category code (automatically selected):*

Human

Is this a resubmission of a previous application?*

- Yes
- No

Is this a pilot study? *

- Yes
- No

Has a pilot study been conducted as part of this project? *

- Yes
- No

Please save and continue to the next page

Consultation

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

Have you undertaken any consultation in preparing this application?*

- Yes
- No

Please describe*

I have undertaken a consultation with my supervisor Dr Klaus Gebel.

Please save and continue to the next page

Section 3: Personnel

Investigators

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#).

Are there external investigators or personnel listed on this protocol?*

- Yes
- No

Is this application for a student project?*

- Yes
- No

Student applicants:

1. Please note that once your application is submitted it will go directly to your supervisor and not to the Committee.
2. We **strongly** recommend notifying your supervisor that you have submitted your application in case of any technical issues, to avoid potential delays in the review process.
3. Once your supervisor endorses your application it will go to your Local Research Office for endorsement before coming to the Ethics Secretariat for review.
4. Your electronic application must be endorsed by your supervisor by the [Local Research Office \(LRO\) submission deadline](#).
5. Please also ensure that the Primary AOU at the end of this page is updated to your supervisor's AOU. This will show in the table under 'Internal personnel listed below', once you add them. If you need any assistance with this please contact Research.Ethics@uts.edu.au or call 9514 9772. Please note that this is particularly important if you have a dual role as a staff/student as your application could go to the wrong faculty for review through the automated process.

Positions in the personnel table

Position type:	In the personnel table use the following positions from the drop-down list:
Chief Investigator/Supervisor	1Chief Investigator (students must not be listed as Chief Investigator)
Co Investigator	3Assoc. Investigator
Co Supervisor	Co-Supervisor
Research Student	5Research Student
Project Administrator	7Project Administrator

Note: Further options are available in the drop down list.

Instructions on how to add a person to the personnel table:

1. Click on "Add"
 2. Start typing the details (first name, last name or Staff ID) in the search bar.
 3. Click on "Add selected"
 4. The extra information panel will open, select their position from the drop-down list. If they are the primary contact (e.g. Chief Investigator/Supervisor), tick "Yes" under "Primary contact" and then select "OK"
- **Student research:** Students must add their supervisors to their application and must mark their primary supervisor as a Chief Investigator and as a primary contact. Students must be listed as "5Research student" under the column "Position" to ensure the application is properly submitted to their supervisor.
 - **Ratifications/Transfers:** If this list differs from that of the original application, you must provide evidence that any additional investigators have been added via amendment to the lead/external HREC (attach relevant amendments and evidence of approval).

Internal personnel listed on this ethics protocol*

1	Primary	No
	ID	
	Surname	Alzahrani
	Given Name	Ali Ahmed A
	Full Name	Mr Ali Ahmed A Alzahrani
	Position	SResearch Student
	Type	International
	AOU	FoH.School of Public Health
	Managing Unit	Faculty of Health
	Email Address	AliAhmedA.Alzahrani@student.uts.edu.au
	Work Number	
2	Primary	No
	ID	
	Surname	Grunseit
	Given Name	Anne
	Full Name	A/Prof Anne Grunseit
	Position	Co-Supervisor
	Type	Internal
	AOU	FoH.School of Public Health
	Managing Unit	Faculty of Health
	Email Address	Anne.Grunseit@uts.edu.au
	Work Number	+61 2 95145985
3	Primary	Yes
	ID	
	Surname	Gebel
	Given Name	Klaus
	Full Name	Dr Klaus Gebel
	Position	Chief Investigator
	Type	Internal
	AOU	FoH.School of Public Health
	Managing Unit	Faculty of Health
	Email Address	Klaus.Gebel@uts.edu.au
	Work Number	+61 2 95144578

If any details are incorrect or missing please contact the Ethics Secretariat on (02) 9514 9772 or by [email](mailto:ethics@uts.edu.au).

Please provide additional (or preferred) contact details of any of the people listed on the project if necessary (4000 character limit)

The question is not answered.

Please provide details of any formal qualifications ([REF NS 1.1\(e\)](#)) of each person listed on the project (4000 character limit)*

1 Doctor Klaus Gebel
Doctor of Philosophy

2 Associate Professor Anne Grunseit
Associate Professor of Public Health

3 Doctor Ali Alzahrani
Bachelor of Medicine and Bachelor of Surgery (MBBS), Master of Public Health (MPH), Doctor of Philosophy candidate.

Please outline the experience of each person listed on this project relevant to this application (4000 character limit)*

Doctor Klaus Gebel is a Senior Lecturer in Public Health. He is also an Adjunct Senior Research Fellow at the Sydney School of Public Health of the University of Sydney. He has master's degrees in exercise science from the German Sport University Cologne and Victoria University, Melbourne, where he first specialised on exercise for rehabilitation and then on physical activity and public health. He did his Ph.D. at the School of Public Health of the University of Sydney. His main research areas are the relationship between built environments, physical activity, and health and the health effects of physical activity. He has published more than 50 peer reviewed journals articles, book chapters and reports and one book. As well, he has peer reviewed more than 100 articles for 56 journals and many abstracts for several conferences.

Associate Professor Anne Grunseit is based at the School of Public Health, University of Technology Sydney as well as Adjunct Associate Professor of Public Health at the Sydney School of Public Health, University of Sydney. She has more than 20 years' experience in behavioural epidemiology, evaluation and social research with government, university and non-government organisations. She has conducted qualitative and quantitative analyses on a range of health prevention topics including physical activity, sedentary behaviour, risk factors for obesity, unhealthy food advertising to children, and tobacco control.

Doctor Ali Abzahrani is a registered medical doctor in the Saudi Commission for Health Specialities as a Public Health resident . He has a master's degree in Public Health from the University of Technology Sydney . Currently, he is a Ph. D. student at the School of Public Health , University of Technology Sydney.

Primary AOU*

FoH, School of Public Health

Managing Unit

Faculty of Health

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Student details

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Degree being undertaken (500 character limit)*

Doctor of Philosophy (Ph. D.) in Public Health

Have you been successful in your doctoral/masters assessment? *

- Yes
 No

Please indicate why you are applying for ethics approval at this stage, and when you will be seeking assessment or re-assessment? (4000 character limit)*

This proposed study is a part of my PhD thesis and will be my second project for my thesis, which is a mixed study that needs UTS ethics approval.

Students, please read carefully: Once you have completed this application and followed the submission instructions, your application will go to your supervisor for review. Once your supervisor has reviewed and endorsed your application it will come to the Ethics Secretariat for a pre-review. This pre-review process helps ensure that your application is complete, has all necessary attachments, and that the quality of responses to the questions meets the Committee's expectations. Your application should therefore be submitted as early as possible. If you do not submit your application in time, it may be delayed and held off until the next closing date.

Section 4: Funding and Disclosure of Interests

Funding details

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#)

Have you received funding in relation to this research?*

- Yes
 No

Do you have a RM 'My Proposals' ID number?*

- Yes
 No

List the source of funding (e.g. funding body / type) [\(REF NS Page 8 "When is ethical review needed?", 2.2.6\(h\), 3.3.5\(a\), 3.3.18\(b\), 4.8.6, 5.2.7, and 5.7\)](#) (2000 character limit)*

A scholarship from King Faisal Medical City , Saudi Arabia
 Ph. D. funding from the Faculty of Health , UTS

Total amount of funding obtained, including in-kind contribution (please indicate which is applicable)

\$3000.00, which is provided by the Faculty of Health, UTS

What is your relationship to the funding source? (e.g. grant recipient, industry partner, contractor, employee, office-bearer, personal, other)*

I am an employee of King Faisal Medical City, Saudi Arabia, which is the official funding source for my scholarship.

Are there any constraints on the research as a result of the funding arrangements, e.g. to intellectual property, publication, etc? (Section 4, The Code)*

- Yes
- No

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Disclosure of Interests

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Do any members of the research team (including persons not listed in this application), have any financial or non financial interests related to this research?*

- Yes
- No

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Section 5: Methodology

Description

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The purpose of this section is to place your research in context for the HREC and demonstrate your ability to conduct the research. The HREC may only approve research which is methodologically sound. Remember to use simple language that can be understood by people from a variety of backgrounds. Avoid jargon and acronyms.

What are the hypotheses/goals/aims/objectives of your research? Please include a brief description using plain English explaining your research aims (approximately 100 words) (4000 character limit)*

The main objective of this study is to identify barriers to physical activity in adults in the Southern region of Saudi Arabia.

Note: Clinical Trials, Recruitment of Participants and Data Collection are dealt with later in the application so you do not need to describe them in detail below

Please provide a brief description of the research design including research questions and proposed methods for conducting the research (approximately 250 words) (4000 character limit)*

This study will be a mixed methods study in which primary qualitative and quantitative data will be collected from the Southern region of Saudi Arabia. We will conduct semi-structured interviews with adults for the first part. Then, we will develop a questionnaire to examine the barriers for the quantitative part. We will try to answer the following questions:

1. What is the prevalence of physical inactivity in the Southern region of Saudi Arabia?
2. What are the cultural barriers to physical activity in the Southern region of Saudi Arabia?
3. What are the environmental barriers to physical activity in the Southern region of Saudi Arabia?
4. What are the social barriers to physical activity in the Southern region of Saudi Arabia?
5. Are these barriers to physical activity considered external or internal to the person?
6. What are the opinions / perspectives of the people regarding these barriers?
7. What is the potential of physical activity policies in the Southern region of Saudi Arabia to address these barriers?

For the qualitative part, I will conduct semi structured interviews with adults in the Southern region of Saudi Arabia. We intend to recruit adults aged 18 years and above from all parts of the Southern region (Asir, Jazan, Najran and Albaha). We will aim to recruit participants for this study through contacting different primary health care centres in the region to reach participants via their general practitioners.

For the quantitative part, this will be a cross-sectional study conducted in the Southern region of Saudi Arabia. We intend to recruit adults aged 18 years and above from all subregions of the Southern region of Saudi Arabia (Asir, Jazan, Najran and Albaha). Intercept or river sampling will be used to recruit the participants. In this process potential participants will receive an invitation to an online survey. We will recruit the participants through multiple social media platforms such as Twitter, WhatsApp, and Facebook. Online surveys can reach a large and geographically dispersed population while obtaining quick results. Moreover, I will contact different primary health care centres in the region to reach more participants via their general practitioners. According to the Ministry of Health in Saudi Arabia, there are 50 on-duty healthcare centres in the four subregions of the Southern region of Saudi Arabia.

What do you hope the outcome(s) of this research will be? (4000 character limit)*

1. To identify barriers to physical activity among adult population in the Southern region of Saudi Arabia.
2. To investigate the opinions and perceptions of the participants towards the barriers to physical activity.
3. To explain the barriers and challenges for improvement and sustainability of the physical activity policies in Saudi Arabia

Who do you think will benefit from this research? (4000 character limit)*

University of Technology Sydney, physical activity policy stakeholders in the region and the community in the southern region of Saudi Arabia.

Please provide a brief description of the significance of your research (approximately 100 words) (4000 character limit)*

The proposed study will make an important contribution to the field of public health, specifically by investigating barriers to physical activity in the Southern region of Saudi Arabia. Furthermore, the study is expected to inform policymakers of the importance of overcoming barriers to physical activity in the Southern region of Saudi Arabia. Lastly, recommendations will be made that will provide guidance for future regional research, policy, and practice to address physical inactivity in the region.

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Literature review & references

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#)

Please give a brief literature review. The aim is to explain how your research fits into the context of other research in the area (REF NS 1.1(c)) (4000 character limit with spaces)
Please note that you cannot paste links into the online form

Some studies have been published about barriers to physical activity in different regions of Saudi Arabia ([1], [2], [3]). However, only one study about barriers to physical activity in the Southern region of Saudi Arabia has been conducted and this one was limited to a specific subgroup of the population (medical students) ([4]). As well, no qualitative studies that examine the opinions and perspectives about barriers to physical activity of the general population in Saudi Arabia in general and the Southern region specifically have been published. The Southern region of Saudi Arabia contains a unique and different culture from the rest of the Kingdom's regions and has a distinct geographic and mountainous terrain ([5]). Therefore, we propose to conduct a mixed methods study in which we identify the social, cultural and environmental barriers to physical activity in the region. Examining the many factors that might hinder (i.e., act as barriers) the successful implementation of physical activity policy at the local level in Southern region is crucial to understanding the implementation process. In our proposed study in the southern region, we will try to identify the barriers to physical activity to improve the region's current physical activity policies.

Please list the references only used in the literature review and cited in your application
NOTE: Do not include references you have not used in this application (4000 character limit)

- 1- Samara, A., et al., Lack of facilities rather than sociocultural factors as the primary barrier to physical activity among female Saudi university students. *International Journal of Women's Health*, 2015, 7: p. 279.
- 2- Abdel-Salam, D. and E. Abdel-Khalek, Pattern and barriers of physical activity among medical students of Al-Jouf University, Saudi Arabia. *Journal of High Institute of Public Health*, 2016, 46(2): p. 41-48.
- 3- Almajwal, A.M., Correlations of physical activity, body mass index, shift duty, and selected eating habits among nurses in Riyadh, Saudi Arabia. *Ecology of food and nutrition*, 2015, 54(4): p. 397-417.
- 4- Awadalla, N., et al., Assessment of physical inactivity and perceived barriers to physical activity among health college students, south-western Saudi Arabia. *East Mediterr Health J*, 2014, 20(10): p. 596-604.
- 5- Abdullah, M. and M. Al-Mazroui, Climatological study of the southwestern region of Saudi Arabia. I. Rainfall analysis. *Climate Research*, 1998, 9(3): p. 213-223.

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Methods and methodologies

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In order to consider your research, the HREC will need to know what it will involve for your participants (REF NS 3.1)

What kinds of methods and methodologies will you use in your research? (More than one box may be checked)*

- Quantitative
- Qualitative

Does your research involve collection and/or use of secondary data? (e.g. existing / routinely collected data etc.)*

- Yes
- No

Please save and continue to the next page

Quantitative

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Section 1: Quantitative Methodologies*

- Experimental
- Quasi-experimental
- Correlational research
- Survey Design
- Meta analysis
- Other *(Please describe below)

Section 2: Quantitative methods*

- Written survey
- Online survey/research
- Pre-post/testing
- Telephone survey
- Questionnaires
- Access to records
- Clinical trial
- Statistical analysis
- Content analysis
- Physiological testing/assessment
- Other* (please describe below)

What **quantitative** methodology and methods will you be using in this research? More than one box may be checked.

Please save and continue to the next page

Qualitative

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What **qualitative** methodology and methods will be using in this research?

Section 1: Qualitative methodology*

- Auto-ethnography
- Historical research
- Action research
- Narrative enquiry
- Biographical research
- Case study
- Phenomenology
- Indigenous research paradigm
- Discourse analysis
- Grounded theory
- Other *(Please describe below)

Section 2: Qualitative methods*

- Participants observation
- Covert observation
- On-line research
- Psychological testing/assessment
- Verbal protocol
- Journaling
- Artifact analysis
- Document/Policy analysis
- Access to records
- Audio/video recording
- Life story or oral history
- Focus groups
- Structured interviews
- Semi-structured interviews
- Unstructured interviews
- Other* (Please describe below)

Please describe how interviews will be conducted, including how many participants will be involved (from each participant group if there is more than one group/cohort), the amount of time required of participants for this, whether it will be recorded, and any other information applicable (4000 character limit)*

I will conduct semi structured interviews with adults in the Southern region of Saudi Arabia. We intend to recruit adults aged 18 years and above from all parts of the Southern region (Asir, Jazan, Najran and Albaha). We will aim to recruit participants for this study through contacting different primary health care centres in the region to reach participants via their general practitioners. The goal of qualitative studies is to answer the research question ([1]). For instance, Boutevillain et al. recruited 16 participants for their semi-structured interviews ([2]). Additionally, Gay and colleagues conducted 20 semi-structured interviews to explore the motivators for and barriers to physical activity in knee osteoarthritis patients ([3]). Therefore, up to twenty-five interviews will be expected to answer the research questions regarding the barriers to physical activity in the Southern region of Saudi Arabia. The interviews are expected to take between 45 to 60 minutes. Moreover, we examine the perspective and opinions of participants regarding the barriers to physical activity. The interviews will be conducted via Zoom and will only be audiorecorded. Personal information will be collected from participants such as name and age. The Arabic language will be used, and transcripts will be translated in English. I and my supervisor will transcribe the interviews. The participants will be provided with the opportunity to review the transcripts for accuracy.

- 1- Saunders, B., et al., Saturation in qualitative research: exploring its conceptualization and operationalization, *Quality & Quantity*, 2018. 52(4): p. 1893-1907.
- 2- Boutevillain, L., et al., Facilitators and barriers to physical activity in people with chronic low back pain: A qualitative study. *PLoS One*, 2017. 12(7): p. e0179826.
- 3- Gay, C., et al., Motivators for and barriers to physical activity in people with knee osteoarthritis: a qualitative study. *Joint Bone Spine*, 2018. 85(4): p. 481-486.

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Section 6: Research participants/subjects part 1

Participant involvement

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#)

What time commitment will the research involve for your participants?

NOTE: This information must be included in any information to participants
(4000 character limit)*

For the qualitative part, the study participants would only need to give around 45 to 60 minutes of their time for the semistructured interview. For the quantitative part, the survey will require no more than 15 minutes to complete.

In what location will the research/data collection take place?

NOTE: This information must be included in any information to participants
(4000 character limit)*

The southern region of Saudi Arabia.

What travel, if any, does the research involve for your participants?

NOTE: This information must be included in any information to participants
(4000 character limit)*

Our study participants will not be required to travel at all.

Please include any additional information relating to participants that you think relevant

NOTE: This information must be included in any information to participants
(4000 character limit)*

The proposed research will not involve any expenses for the participants.

Describe and justify any benefit, payment or compensation the participants will receive. For research being conducted with Aboriginal and Torres Strait Islander People, the described benefits from research should have been discussed with and agreed to by the Aboriginal or Torres Strait Islander research stakeholders. (REF NS 2.1) and 4.7.8 & 4.7.9)
(4000 character limit)*

Participation in this research will be voluntary. There will be no payment or compensation for the participants.

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Recruitment of participants

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In line with the National Statement, the definition of participants includes not only those humans who are the primary focus of the research but also those who will be affected by the research. The HREC regards the principle of respect for persons as of paramount importance. (REF NS 1.1 (d), 1.6-1.9, 1.10, 2.1).

How will you initially select and contact your participants? More than one box may be checked, if appropriate*

- Advertisement/flyer
- E-mail
- Telephone
- Internet
- Organisation
- Personal contact
- Letter
- Other contact method to be used

Outline how you will obtain participants' contact details*

The participants' contact details will be obtained from the Saudi Ministry of Health by sending an email to GPs in randomly selected primary health care centers. The email will include an introduction to the research and a request to identify participants from each primary care center. We have gained approval for this study from the Saudi Ministry of Health. Therefore, the letter of approval from the Saudi Ministry of Health will be presented to the managers of each primary care centre and the GPs to facilitate obtaining contact details for adults willing to participate in the study. The GPs will also be asked to give the participant information sheet to anyone who wants to participate in our study. We will only require the name, email, or mobile number of participants who have accepted to participate in the study. In our study, we will not need further details, such as the participants' medical history.

Please describe your recruitment plan/strategy*

After obtaining the contact details of participants from the primary care centers, the participants will be contacted directly via email or telephone. I will invite the participants and will explain the aims of our study to them. The participants will be asked to sign the consent form via email before the interview.

How many participants do you intend to recruit? (If you are intending to recruit different groups of participants, please answer all relevant questions for each group, e.g. control group, test group, etc.) (4000 character limit)*

For the qualitative part, answering the research question and data saturation are the main goals of qualitative studies. Based on previously mentioned other qualitative studies that examined barriers to physical activity, 25 participants are expected to be sufficient. If the data saturation was not achieved, we could interview more participants. For the quantitative part, we will require at least 267 participants for this proposed study.

Explain how and why you have chosen this number. If the research is quantitative, explain the power calculations; if the research is qualitative, explain why the proposed number is likely to result in adequate data based on evidence/literature. For guidance, check our [Fact Sheets](#).*

For the quantitative study, we aim to explore the prevalence of and perceived barriers to physical activity in the population. We will conduct the qualitative study first to incorporate the findings into the design of the survey. We used the following formula to calculate the required sample size.

$$n = z^2 * p * (1 - p) / e^2$$

Where n is the sample size, z is the z score, e² is the margin of error, p is the proportion of the sample of adults in southern region of Saudi practicing physical activity in relation to the barriers. Assuming that at the level of 95% confidence, p = .223, e² = .05, Z score for 95% confidence = 1.96. In Saudi Arabia, a study analysed the Bulletin of Household Sports Practice National Survey in 2020 showed that only 22.32% of the population in Southern region were physically active. Therefore, we will require at least 267 participants for this proposed study.

Describe your inclusion and exclusion criteria for participants*

To be eligible for inclusion participants need to be at least 18 years old and need to live in the Southern region of Saudi Arabia.

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Consent

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#)

Will you be obtaining written consent?*

- Yes
- No

Please provide sample documents in attachments list at the end of the application form

Please use the following HREC templates when creating an information sheet and consent form: [HREC templates](#)

Do you believe there will be any special issues relating to consent in your research? (REF NS 1.13, 2.2, 2.3, Chapter 4)*

- Yes
- No

Are the participants able to consent fully? (REF NS Chapter 2, 4.4, 4.5)*

- Yes
- No

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Limited disclosure

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Does this research involve limited disclosure to participants? (REF_NS_2.3)*

- Yes
- No

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Ethical considerations specific to participants

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Indicate if your research will involve the following populations (as per the National Statement) other than as incidental participants (i.e. they are not included in the design of the project but may be participants) (REF_NS_Chapter_4)

- Women who are pregnant and the human foetus
- Children and young people
- People in dependent or unequal relationships
- People highly dependent upon medical care who may be unable to give consent
- People with a cognitive impairment, an intellectual disability or a mental illness
- People who may be involved in illegal activities
- People who are incarcerated
- Aboriginal and Torres Strait Islander Peoples
- People in other countries
- None of the above

If your research is being conducted in Australia, does it involve Culturally and Linguistically Diverse (CALD) People (other than incidentally)?*

- Yes
- No

Does your research involve Defence or the Department of Veteran Affairs in any way?*

- Yes
- No

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Section 7: Research participants/subjects part 2

Risk/harm

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Risk or harm could be described as damage or hurt to the wellbeing, interests or welfare of an individual, institution or group. Harm could range from physical hurt or damage such as illness or injury, to psychological or emotional hurt or damage, such as embarrassment or distress. Please note that as a researcher, you are not necessarily immune from risk yourself and should give careful consideration to this question (REF_NS_2.1).

NOTE:

It is **really** important that you carefully consider all **potential** risks that could occur, even if they seem negligible. Please **do not** provide one-word answers to any of the questions below. Describe, as best as you can, any possible risks to research participants, subjects and related groups

NOTE: This information must be included in any information to participants (4000 character limit)*

This research will be involving semistructured interviews with adult participants from the Southern region of Saudi Arabia . Therefore, minimal risks would be expected. For example, the participants may be interrupted by background noise during the Zoom interview. In this case, they will be offered to postpone the interviews to a different time. Interviews with female participants could be a cultural risk (i.e., interviewing a woman without the presence of a male guardian). So, I will clarify that the meeting will be only audio recorded in the case of using Zoom meetings. Additionally, discomfort in discussing barriers to physical activity would be the main risk in this type of studies. To mitigate this risk, I am committed to anonymise the interview transcripts and the data will not be shared with any organisation except my supervisor and UTS (The Graduate Research School). After each interview, the participants will be told that they can get the results of the study by emailing or calling the researchers.

How would you categorise the magnitude of potential risk? (e.g. inconvenience, discomfort, harmful, painful)
Explain why you believe this is so (4000 character limit)*

Slight inconvenience for the participants would only be expected from the time it takes them to take part in the interviews, respectively to complete the online survey.

How would you categorise the likelihood of risk? (I.e. slight, possible, likely, probable, unavoidable)
Explain why you believe this is so (4000 characters)*

The proposed research would only cause a slight risk.

What strategies will you use to minimise and/or manage the risks? (4000 character limit)*

This research will be involving semistructured interviews with adult participants from the Southern region of Saudi Arabia . Therefore, minimal risks would be expected. For example, the participants may be interrupted by background noise during the Zoom interviews. In this case, they will be offered to postpone the interviews to a different time. Interviews with female participants could be a cultural risk (i.e., interviewing a woman without the presence of a male guardian). So, I will clarify that the meeting will be only audio recorded in the case of using Zoom meetings.

Discuss likely or possible risk to researchers (including yourself), and your strategies for minimising such risks (4000 character limit)*

When conducting this study, there will be no predicted risks for the researchers.

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Pre-existing relationships

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Are there likely to be any pre-existing relationships with research participants? (e.g. employer/employee, colleague, friend, relation, student/teacher, etc) ([REF_NS_4.3](#))*

- Yes
 No

Will you be recruiting UTS staff and/or students as research participants?*

- Yes
 No

Please save and continue to the next page

External organisations

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Indicate if your research will involve any of the following:*

- Institution
 Organisation
 Community Group
 None of the above

Please save and continue to the next page

Section 8: Data

Data collection & use

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Does your research involve access to student records at this University?*

- Yes
 No

Provide an analysis plan outlining how the aims/objectives will be met, the statistical methods to be used, and who will be carrying out the analysis. *

For the qualitative part of my proposed study, the analysis will be conducted by the research team using thematic analysis which can be described as a technique for detecting, analysing, and reporting patterns and themes in data. The phases of thematic analysis will be followed in line with Braun and Clarke. After transcribing the interviews, I will familiarise myself with the data by reading and rereading the transcripts. Then, I will start generating the codes inductively in which the meanings will be identified without importing ideas. Next, codes will be collated with their associated data and themes will be generated. After that, the themes will be revised and defined to avoid any inclusion of overlapping or weak themes. Finally, the report will be produced. The research team will be involved in each step of the analysis to ensure the quality of analysis and to minimise any bias. For the quantitative part, the data from the online survey will be imported to SPSS for cleaning and analysis. Finally, I will analyse the data using the Statistical Package for Social Sciences (SPSS) and based on the results, we will illustrate the most important barriers in the region and will provide our recommendations for governmental agencies, NGOs and other researchers.

Describe any foreseeable future use of this data; such as sharing with other researchers, secondary use for related research, publishing for unrelated research and non-research purposes and any other possible uses. Please note this information must be included in the participant information sheet.*

There will be no sharing of data with other researchers except my supervisor and other coauthors. After ensuring the anonymity of participants, the results and recommendations of our study could be shared with the funding body or the Ministry of Health to improve physical activity promotion in the country. However, this proposed study will be the second part of my PhD thesis. We intend to publish our results in a peer-reviewed journal. Regarding privacy and confidentiality, I will tell the participants before the interviews that we are committed to treating all information confidentially. Before the interviews they will be asked whether they have read the consent form, whether they have any questions about the study or the interviews, and whether they want to take part in the study. The participant information will not be shared with any organization or persons except UTS and the researchers. Since the interviews will be conducted by Zoom Audio not involving video, privacy is expected to be achieved.

Do you have a research data management plan?*

- Yes
- No

Please save and continue to the next page

Section 9: Additional information

Other ethical issues

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If there are any additional ethical issues which you do not believe have been covered by this form, please explain them for the HREC: (4000 character limit)*

There are no expected ethical issues

Please save and continue to the next page

Section 10: Attachments

Attachments

We recommend you save your application regularly while editing. You can save your application at any time by clicking on the save button. For further information and help in completing your application go to our [website](#)

I have attached the following supporting documents

Budget page from funding application*

- Yes
- N/A

Sample research advertisement/announcement

- Yes
- N/A

Participant Information Sheet(s)*

- Yes
- No

Informed consent form(s)*

- Yes
- N/A

Explanations of any technical terms used *

- Yes
- N/A

Research data management plan (RDMP)*

- Yes
- No

Standard Operating Procedures

N.B. May include a [distress](#) or disclosure protocol [see [UTS HREC Disclosure Guidelines](#) under University policies and guidelines], [Faculty of Health - Low Risk protocol](#); procedures for participant screening, physiological, or biological sampling and/or laboratory or safety procedures where relevant.

- +
- Yes
 - No

Please explain why any of the above items have not been attached (either softcopy/hardcopy) and when they will be provided (4000 character limit)*

All documents have been attached.

Documents attached to this application:

How to attach documents

1. Click on 'Add'
 - Ensure the fields are as follows:
 - o Document type- soft copy
 - o Name: Include the document name and version number
 - o Description: This field is optional
2. You can then either select the file you want to upload OR drag and drop it where it says 'Drop file here'
3. Click on 'OK'

Note: Please use the following HREC templates when creating an information sheet, consent form, verbal script, etc.: [HREC templates](#). All submitted documents should be titled, and have version control included in the footer.*

1	Document type	Soft copy
	Name	letter of approval Saudi Arabia
	Reference (Document Title)	Kingdom of Saudi Arabia.pdf
	Description	letter of approval from Saudi Arabia
2	Document type	Soft copy
	Name	Participant information sheet
	Reference (Document Title)	Participant information sheet- project 2_KG.docx
	Description	Participant information sheet
3	Document type	Soft copy
	Name	RDMP
	Reference (Document Title)	rdmp Final.pdf
	Description	The Research Data Management Plan
4	Document type	Soft copy
	Name	ETH22-7510 Faculty of Health Low Risk Ethics Panel Outcome and Comments_final
	Reference (Document Title)	ETH22-7510 Faculty of Health Low Risk Ethics Panel Outcome and Comments_final.docx
	Description	
5	Document type	Soft copy
	Name	Email Invitation GPs
	Reference (Document Title)	Email Invitation GPs_final.docx
	Description	

Reminder to student applicants:

1. Please note that once your application is submitted it will go directly to your supervisor and not to the Committee.
2. We **strongly** recommend notifying your supervisor that you have submitted your application in case of any technical issues, to avoid potential delays in the review process.
3. Once your supervisor endorses your application it will go to your Local Research Office for endorsement before coming to the Ethics Secretariat for review.
4. Your electronic application must be endorsed by your supervisor by the [Local Research Office \(LRO\) submission deadline](#).
5. Please also ensure that the Primary AOU listed at the end of the Investigators page is updated to your supervisor's AOU. This will show in the table under 'Internal personnel listed below', once you add them. If you need any assistance with this please contact Research.Ethics@uts.edu.au or call 9514 9772. Please note that this is particularly important if you have a dual role as a staff/student as your application could go to the wrong faculty for review through the automated process.

Declaration

Declaration

I have answered all questions in the risk assessment truly and completely to the best of my knowledge.

I will notify the UTS Human Research Ethics Committee of any variation to this research that may alter the level of risk associated with it.

This research will be undertaken in compliance with the UTS Research Policy or any replacement or amendment thereof.

This research will be undertaken in compliance with the Australian Code for the Responsible Conduct of Research and National Statement on Ethical Conduct in Human Research.

Please click on the "Submit" button in the Actions menu.

Confirmation

Confirmation by Local Research Office Low Risk

Application type*

Research (student project)

Internal personnel listed on this ethics protocol*

1	Primary	No
	ID	[REDACTED]
	Surname	Alzahrani
	Given Name	Ali Ahmed A
	Full Name	Mr Ali Ahmed A Alzahrani
	Position	SResearch Student
	Type	International
	AOU	FoH.School of Public Health
	Managing Unit	Faculty of Health
	Email Address	AliAhmedA.Alzahrani@student.uts.edu.au
	Work Number	
2	Primary	No
	ID	[REDACTED]
	Surname	Grunseit
	Given Name	Anne
	Full Name	A/Prof Anne Grunseit
	Position	Co-Supervisor
	Type	Internal
	AOU	FoH.School of Public Health
	Managing Unit	Faculty of Health
	Email Address	Anne.Grunseit@uts.edu.au
	Work Number	+61 2 95145985
3	Primary	Yes
	ID	[REDACTED]
	Surname	Gebel
	Given Name	Klaus
	Full Name	Dr Klaus Gebel
	Position	Chief Investigator
	Type	Internal
	AOU	FoH.School of Public Health
	Managing Unit	Faculty of Health
	Email Address	Klaus.Gebel@uts.edu.au
	Work Number	+61 2 95144578

Confirmed by:*

RTalan

Faculty reference number if applicable (e.g. faculty TRIM number, otherwise write "N/A")

N/A

Please select "Local Research Office review" from the dropdown list.*

Local Research Office review

Date of review*

24/10/2022

The Local Research Office has certified that:

- This application has been deemed low risk by the Faculty/School/Centre in accordance with the National Statement on Ethical Conduct in Human Research (Chapter 2.1).
- All information in this application and supporting documentation is correct and as complete as possible.
- This research will be undertaken in compliance with the UTS Research Ethics and Integrity Policy or any replacement or amendment
- This research will be undertaken in compliance with the Australian Code for the Responsible Conduct of Research and National Statement on Ethical Conduct in Human Research.

*

- Yes
 No

Confirmation by ADR

Application type

Human

Internal personnel listed on this ethics protocol

1	Primary	No
	ID	[REDACTED]
	Surname	Alzahrani
	Given Name	Ali Ahmed A
	Full Name	Mr Ali Ahmed A Alzahrani
	Position	SResearch Student
	Type	International
	AOU	FoH.School of Public Health
	Managing Unit	Faculty of Health
	Email Address	AlAhmedA.Alzahrani@student.uts.edu.au
	Work Number	
2	Primary	No
	ID	[REDACTED]
	Surname	Grunseit
	Given Name	Anne
	Full Name	A/Prof Anne Grunseit
	Position	Co-Supervisor
	Type	Internal
	AOU	FoH.School of Public Health
	Managing Unit	Faculty of Health
	Email Address	Anne.Grunseit@uts.edu.au
	Work Number	+61 2 95145985
3	Primary	Yes
	ID	[REDACTED]
	Surname	Gebel
	Given Name	Klaus
	Full Name	Dr Klaus Gebel
	Position	Chief Investigator
	Type	Internal
	AOU	FoH.School of Public Health
	Managing Unit	Faculty of Health
	Email Address	Klaus.Gebel@uts.edu.au
	Work Number	+61 2 95144578

Faculty reference number if applicable (e.g. faculty TRIM number)

N/A

Declaration:

- I am aware that this research is being conducted within this Faculty/School/Centre.
- I am satisfied that the researchers have met all Faculty/School/Centre requirements in relation to this research.
- I am satisfied that this research has been deemed low risk by the Faculty/School/Centre in accordance with the National Statement on Ethical Conduct in Human Research (Chapter 2.1).
- This research will be undertaken in compliance with the UTS Research Ethics and Integrity Policy or any replacement or amendment thereof.
- This research will be undertaken in compliance with the Australian Code for the Responsible Conduct of Research and National Statement on Ethical Conduct in Human Research.

*

- Yes
- No

Date Approved/Endorsement*

[REDACTED]

This question is not answered.

Comments

This question is not answered.

Appendix 5: Ethical approval for the third research phase project

Dear Applicant,

Re: ETH22-7510 - "Barriers to physical activity in the Southern region of Saudi Arabia - Mixed methods study"

Your local research office has reviewed your application and agreed that it now meets the requirements of the National Statement on Ethical Conduct in Human Research (2007) and has been approved on that basis. You are therefore authorised to commence activities as outlined in your application, subject to any conditions detailed in this document.

You are reminded that this letter constitutes ethics approval only. This research project must also be undertaken in accordance with all UTS policies and guidelines including the Research Management Policy.

Your approval number is UTS HREC REF NO. ETH22-7510

Approval will be for a period of five (5) years from the date of this correspondence subject to the submission of annual progress reports.

The following standard conditions apply to your approval:

- Your approval number must be included in all participant material and advertisements. Any advertisements on Staff Connect without an approval number will be removed.
- The Principal Investigator will immediately report anything that might warrant review of ethical approval of the project to the [Ethics Secretariat](#).
- The Principal Investigator will notify the Committee of any event that requires a modification to the protocol or other project documents, and submit any required

Appendix 6: Evidence of Research Integrity Modules completion

Research Integrity quiz Results for Ali Ahmed A Alzahrani

Score for this attempt: **10** out of 10
Submitted Feb 7, 2021 at 6:32
This attempt took 2 minutes.

Quiz Submissions

Attempt 1: 5
Attempt 2: 10

This quiz has unlimite

[← Back to Quiz](#)

Question 1

1 / 1 pts

Which of the following are **all** Research Integrity Principles?

- Honesty, attribution, transparency
- Respect, rigour, recognition
- Respect, beneficence, merit, justice
- All of the above

Correct!

Question 2

1 / 1 pts

Appendix 7: Evidence of Research Data Management plan



Physical activity policies in Gulf Collaboration Council countries: A qualitative study with document analysis and stakeholder interviews

Description

The aim of this research is to analyse physical activity policies in the Gulf Cooperation Council countries (Saudi Arabia, UAE, Qatar, Bahrain, Kuwait, and Oman) and to provide suggestions for the optimal delivery of PA policies in these countries.

Expand/Collapse all

- Project

Project overview

Project name

Physical activity policies in Gulf Collaboration Council countries: A qualitative study with document analysis and stakeholder interviews

Research Master Project Code / Student ID

[Redacted]

HDR student project

Project description

The aim of this research is to analyse physical activity policies in the Gulf Cooperation Council countries (Saudi Arabia, UAE, Qatar, Bahrain, Kuwait, and Oman) and to provide suggestions for the optimal delivery of PA policies in these countries.

Keywords

Start date

End date

Funders

Grant ID

- People

People

First-named chief investigator / UTS supervisor

Name	Email	Project Role	ORCID
Klaus Gebel	Klaus.Gebel@uts.edu.au	Chief Investigator	

Data manager

Name	Email	ORCID
Ali-Ahmed-A Alzahrani	aliahmeda.alzahrani@student.uts.edu.au	

Contributors

Name	Email	ORCID
------	-------	-------

Additional supervisors

Name	Email	ORCID
------	-------	-------

- Ethics and security

Ethics and Security

Initially your research data is classified as UTS Internal. To improve the accuracy of this classification, please answer the following

Information Security Classification

UTS: Confidential

Does the research involve:

Human participant data

Will the data you collect from individuals include personal information?

Yes

Will the data you collect from individuals include sensitive personal information other than health information?

No

Will the data you collect from individuals include health information?

No

Will any data or information be individually identifiable or potentially re-identifiable (i.e. include codes) at any stage of the research?

No

Is Ethics approval required for your project?

Yes

- Data collection and storage

Data collection and storage

Please provide a brief description of your data collection methodology

The Physical activity policy documents will be collected from the official government websites in the GCC countries or WHO websites. Furthermore, I am planning to conduct semi-structured interviews with stakeholders from three ministries (Health, Education and Sport) in Saudi Arabia and the other GCC countries. Data saturation or theme saturation is the main goal of qualitative studies. Therefore, we expect that interviews with three to six participants from each ministry will be sufficient. The interviews will be short (15 minutes maximum) because most of the stakeholders will be policymakers in their field and will be busy. The interviews will be audio recorded.

Predominant file type(s), e.g. textual, tabular, image or recording. Give file format if known

The interviews will be audio recorded.

Data storage location

Other (please specify)

If other, provide further details: (Including access arrangements for the minimum retention period)

The recorded interviews will be stored in a secured hard desk drive and locked with a password.

- Data retention and disposal

Data retention and disposal

Minimum retention period

5 years (general research)

The data steward is:

Klaus Gebel

Have you made commitments to destroy part of the data prior to end of retention period (e.g original recordings, linking/code files)?

No

When should it be destroyed?

- Access and rights

Access and rights

Copyright and intellectual property owners of data created in project

University of Technology Sydney jointly with... (enter other owners below)

Please list any other owners:

Dr Klaus Gebel - the main supervisor

Dr Ali Ahmed Alzahrani - PhD student

Access after the project will be

Mediated, by permission from the data manager

Are you using any secondary or third-party data?

No

Licences or Agreements:

- Research Workspace

Research Workspace

Associated workspaces

Name	Description	Location	Type
------	-------------	----------	------



Barriers to physical activity in the Southern region of Saudi Arabia - Mixed methods study

Description

The main objective of this study is to identify the barriers to physical activity in adults in the southern region of Saudi Arabia.

Expand/Collapse all

- Project

Project overview

Project name

Barriers to physical activity in the Southern region of Saudi Arabia - Mixed methods study

Research Master Project Code / Student ID

[Redacted]

HDR student project

Project description

The main objective of this study is to identify the barriers to physical activity in adults in the southern region of Saudi Arabia.

Keywords

Start date

End date

Funders

Grant ID

- People

People

First-named chief investigator / UTS supervisor

Name	Email	Project Role	ORCID
Klaus Gebel	Klaus.Gebel@uts.edu.au	Chief Investigator	

Data manager

Name	Email	ORCID
Ali-Ahmed-A Alzahrani	aliahmeda.alzahrani@student.uts.edu.au	

Contributors

Name	Email	ORCID
------	-------	-------

Additional supervisors

Name	Email	ORCID
------	-------	-------

- Ethics and security

Ethics and Security

Initially your research data is classified as UTS Internal. To improve the accuracy of this classification, please answer the following

Information Security Classification

UTS: Confidential

Does the research involve:

Human participant data

Will the data you collect from individuals include personal information?

Yes

Will the data you collect from individuals include sensitive personal information other than health information?

Yes

Will the data you collect from individuals include health information?

No

Will any data or information be individually identifiable or potentially re-identifiable (i.e. include codes) at any stage of the research?

No

Is Ethics approval required for your project?

Yes

- Data collection and storage

Data collection and storage

Please provide a brief description of your data collection methodology

This study will be a mixed methods study in which primary qualitative and quantitative data will be collected from people in the Southern region of Saudi Arabia. We will conduct semi-structured interviews with adults for the first part. Then, we will develop a questionnaire to examine the barriers for the quantitative part.

Predominant file type(s), e.g. textual, tabular, image or recording. Give file format if known

The interviews will be audio recorded. The survey will be online.

Data storage location

eResearch Store network drive

If other, provide further details: (Including access arrangements for the minimum retention period)

- Data retention and disposal

Data retention and disposal

Minimum retention period

5 years (general research)

The data steward is:

Klaus Gebel

Have you made commitments to destroy part of the data prior to end of retention period (e.g original recordings, linking/code files)?

No

When should it be destroyed?

- Access and rights

Access and rights

Copyright and intellectual property owners of data created in project

University of Technology Sydney jointly with... (enter other owners below)

Please list any other owners:

Dr Klaus Gebel - main supervisor
Dr Ali Ahmed Alzahrani - PhD student

Access after the project will be

Mediated, by permission from the data manager

Are you using any secondary or third-party data?

No

Licences or Agreements:

Appendix 8: Graduate Research Study Plan



HDR eForm

Student Name :

Mr Ali Ahmed A. Alzahrani

General Information

Notes to Student

GRADUATE RESEARCH STUDY PLAN

The Graduate Research Study Plan (GRSP) is an opportunity to take ownership of your unique research journey, from beginning to end. By identifying development goals and specific steps to achieve those goals, you'll ensure that you are making the most out of your HDR study and progressing toward a meaningful conclusion.

The [UTS HDR Capability Framework](#) can guide your approach to your GRSP. Its five interlocking components highlight the capabilities required to develop research-based knowledge and skills that are necessary to producing a variety of research outputs and relevant to a diverse range of careers.

If you have created multiple draft form, please delete them, as any duplicates for this form still in 'draft' will be deleted from the system.

Need help?

If you need assistance to complete the form (technical issues) or having difficulty contacting your supervisor (due to supervisory conflict or no response or your supervisor being away), please seek advice for assistance by contacting:

Faculty - first point of contact

Please contact your faculty's [Research Officer \(RO\)](#). You may be referred to contact the Responsible Academic Officer (RAO) in your faculty who is responsible for overseeing research student matters.

University GRS - If issues are not resolved

If your issue cannot be resolved at faculty level you should seek advice from the [Graduate Research School \(GRS\)](#).

Please refer to the [Graduate Research Candidature Management, Thesis Preparation and Submission Procedures](#) for information regarding how to manage your candidature, including candidature variations, progress and thesis submission.

Note: Personal details listed on this form are in accordance with [MyStudentAdmin](#). Any enquiries in relations to candidature details please contact [GRS](#).

Candidature details

UTS Student Number:

First Name:

Surname:

Course Code/Name:

School/Faculty:

Current EWS Date:

Study Load:

Your current thesis title is:

Are you a collaborative degree student? Collaborative degree student means your PhD project is jointly supervised by academics at UTS and one of our international partnering institutions and you have signed a candidate agreement that formalises your collaborative research study at UTS.*

- Yes
- No

Supervisor details

Is your principal supervisor available to sign off this form? If your principal supervisor is not available (such as on leave for some time and unable to sign this form) select "No".*

- Yes
- No

Signatory supervisory panel: Note: By default, your application will be sent to the person who holds the sign-off delegation. To view details select supervisor and click open.

1	Sign-off delegate?	Yes
	Active?	Yes
	Position	Principal Supervisor
	Preferred First Name	Klaus
	Preferred Last Name	Gebel
	Preferred Full Name	Dr Klaus Gebel
	Email Address	Klaus.Gebel@uts.edu.au
2	Sign-off delegate?	No
	Active?	Yes
	Position	Co-Supervisor
	Preferred First Name	Anne
	Preferred Last Name	Grunseit
	Preferred Full Name	Anne Grunseit
	Email Address	Anne.Grunseit@uts.edu.au

Non-signatory supervisory panel:

This question is not answered.

Graduate Research Study Plan

Graduate Research Study Plan

Please specify the last Candidature Stage Assessment that you were assessed at:*

- No assessment completed yet
- Candidature Stage 1 - confirmation of candidature
- Candidature Stage 2 - confirmation of advanced progress
- Candidature Stage 3 - confirmation of readiness to submit thesis for examination

Development goals:

For each of the following capability areas, identify specific development goals for this session, using SMART goals. (You can learn more about setting SMART goals [here](#)). Include the activities you will undertake to progress toward those goals and how you will assess whether you achieved them. Please note that any listed goals and activities which are not achieved in this session can be carried over to the next session.

Research Knowledge and Skills:

Researchers need a strong foundation in disciplinary knowledge, developing research questions, and research methods. To understand what this capability might look like at different stages of candidature, please refer to the [UTS HDR Capability Framework](#) on the GRS website.*

- 1- Conduct sophisticated analyses.
- 2- Synthesise findings and develop a coherent story from the results.
- 3- Make critical contributions to improving local, institutional, scholarly, and/or professional research communities.
- 4- Produce the knowledge and artefacts of the scholarly community.
- 5-Demonstrate near completion of thesis.

Research Communication:

Researchers need to be able to communicate their research and its implications to a diversity of audiences, using a range of media, from the thesis and journal articles for academics and scholars, to presentations, broadcasts, videos and social media aimed at audiences in the community, including journalists and funders. To understand what this capability might look like at different stages of candidature, please refer to the [UTS HDR Capability Framework](#) on the GRS website.*

- 1- Successfully argue the nature and impact of their contribution to the field, based on experience, expertise and literature.
- 2-Contribute to and/or change the direction of the conversation within the discipline/field/profession through publicly available communication of new knowledge/insights.

Research Governance and Research Management:

Researchers have a responsibility to act with integrity, engage in ethical research practices, and understand the policies that govern the management of research projects and programs. To understand what this capability might look like at different stages of candidature, please refer to the [UTS HDR Capability Framework](#) on the GRS website.*

- 1- Demonstrate that research has been conducted to the highest standard of transparency and ethical behaviour.
- 2- Publish data to standards expected of discipline/project.

Impact, Engagement and Collaboration:

Successful researchers learn to look beyond themselves and their own project, as they create and develop relationships within scholarly and professional networks. Through these networks, they can engage with real world problems and with the direct and indirect impact their research makes. To understand what this capability might look like at different stages of candidature, please refer to the [UTS HDR Capability Framework](#) on the GRS website.*

- 1- Demonstrate the potential impact of one's work in the broader context of society and community
- 2- Establish strong relationships with key people and create links in order to, for example, plan future research projects and take up opportunities for the development/implementation of the research outcomes

Career Planning:

HDR study prepares graduates for leadership roles in the widely diverse range of industries and organisations that rely on research or research skills to solve real-world problems, including but not limited to academia, business, government, cultural and community organisations. Planning for a fulfilling career after graduation involves developing an awareness of the researcher's specialised knowledge and skills, and how to present those skills to optimise career potential. To understand what this capability might look like at different stages of candidature, please refer to the [UTS HDR Capability Framework](#) on the GRS website.*

- 1- Plan next steps in research career
- 2- Update online professional profile
- 3-Revise cv/resume with support from SSU
- 4-Use an online tool to develop a skills profile
- 5- Identify job opportunities requiring your knowledge and skillset
- 6-Discuss career paths with members of the broader research, industry or professional community
- 7-Participate in practice interviews and seek feedback on written application materials
- 8-Participate/engage in external professional networks, associations, or events

Enrolment and Training

Subjects as per your Study Plan are:

1	Subject Code	96708_V1
	Name	PhD Thesis: Public Health
	Subject Type	Thesis
	Compulsory?	Yes
	Year	2021
	Session	Research Session 1
	Status	Enrolled
	Faculty	FDH, Faculty of Health

Your thesis subject is attached to your course code and refers to your Higher Degree Research program. The Coursework subjects are compulsory and need to be completed as part of your course requirements.

- If you require recognition of prior learning please submit a [Credit Recognition](#) request.
- If you require to vary your coursework to an alternate session please submit a [Variation of Program request](#).

Following are the details on the training requirements applicable to your program. Please note that the links will take you to a page outside of ResearchMaster:

Training Module	Expected date of completion
Consent matters training	End of your current session
Research integrity module	No later than your Stage 1 assessment. If the link loads an "Access Denied" page after logging in, please contact GRS

Acceptance

Student declaration

This study plan reflects the discussions as emerged between me and my supervisor. Tick "I Agree" box below and click "Submit GR5P" to submit to the supervisor for review and/or sign-off OR click "Save" if this is not ready for submission.*

I Agree

Date:

25/11/2024

Appendix 9: Interview guide for the first study

Interview guide

Introduction

Welcome, and thank you for agreeing to participate in this interview.

I am Dr Ali Alzahrani, and I am conducting this interview as part of a study aimed at understanding the cross-sectoral barriers and facilitators for the development, implementation, and evaluation of physical activity policies in the Gulf states.

Purpose of the interview

From this interview I am aiming to gather your insights and experiences regarding the factors that either support or hinder the development, implementation, and evaluation of physical activity policies in your organization. I am also interested in hearing your perspectives on the challenges and opportunities associated with these policies. There are no right or wrong answers, and the goal is to get your personal opinions.

Your role

I am really looking forward to hearing from you because I want to:

- Capture your views and experiences on physical activity policies.
- Capture your perspectives and experiences regarding the implementation of physical activity policies and the challenges they face.

Confidentiality

I would like to clarify that your privacy is of utmost importance. Any information provided during this interview will be treated with strict confidentiality. Your identity will not be disclosed in any publication coming out of this study, and any identifiable details will be anonymised to ensure privacy. We will not

identify you in the results - anyone reading the results of the study would not be able to identify anyone who has been interviewed from what is said. I just want to let you know that the interviews will be reviewed by my doctoral supervisors at the University of Technology Sydney for the purpose of data analysis, but the transcripts will be anonymised so they will not know the identity of the people I was speaking with.

Duration and consent

This interview might take up to 30-45minutes depending on how much you have to say. Is that length of time O.K. for you, or is there anything you might need to rush off to? [if they do, then say we will try and get as far as we can and then, if we do not finish, would you like to schedule another time?] If you have any questions before we begin, feel free to ask. With your permission, I'd like to audio record our conversation to make sure I capture everything you say. Is that O.K. with you? I may at some points make some notes – they are just to remind me what I might need to come back to to get more detail on, so I am not interrupting you. I have an interview guide, but my questions will be shaped by what you tell me, so it is more like a conversation.

[I will start the Zoom audio recording at this point if consent is given. If consent is not given to audio record, then I will ask if it is O.K. to take notes].

Before we commence, could you please confirm your understanding of the interview's purpose and freely consent to participate? If there are specific questions you would rather not answer, you can let me know during the interview.

Background information

Demographic characteristics

To start off with, I just would like to get a few personal details from you.

- What is your name?
- Which organization do you work for?

- What is your position?
- How old are you?
- What is your previous work experience?

Thanks for that. Now, we will move on to the next topic.

Relevant policy documents

The first topic I would like to talk about with you is the most important policy documents related to physical activity. What are the most important / relevant policy documents in your area in the past 2-3 years that have any relevance for population levels of physical activity?

- Can you explain X, Y and Z in more detail?
- What is the most important policy document among these?
- Regarding the X PA policy document, why do you think it is the most important policy document at the moment?
- How have these documents specifically aimed to increase physical activity?
- What impact have these policies had on actual physical activity levels among the population?

Strengths

[acknowledge what the person has said] So just moving now to strengths of (your sector) in delivering PA policy in Saudi Arabia.

- What are the strengths of (your sector) in delivering PA policy in Saudi Arabia?
- Why do you believe that X and Y are strengths?
- What capabilities does your sector have that facilitate the effective delivery of these policies?

Challenges

Now, let's talk about the challenges in developing and delivering PA policies in your sector.

- What are the challenges developing and delivering policy relevant to physical activity from [your sector]?
- Why do you believe that X and Y are challenges?
- How do these challenges affect the overall effectiveness of physical activity policies in your sector?

Policy development process

Let's now move on to policy development process and stakeholder engagement.

- How was that policy document put together?
- Did it involve consultations or was it mostly internal in your department? Can you describe more?
- If it involved stakeholders, who were they?
- What consultations occurred?

Policy implementation and monitoring

[acknowledge what the person has said] Very good. Now, let's discuss the policy implementation and monitoring within your sector.

- How is this policy (X and / or Y and Z) currently being implemented / delivered?
- Is there any monitoring to assess if it is being delivered as intended?
- What methods or strategies are being used to implement this policy?
- Who are the key personnel or teams involved in the implementation process?

Future opportunities for enhancing physical activity policy

Now, let's move on to your opinion about future opportunities for improving the development of physical activity policies.

- What opportunities exist for better developing physical activity policy in the future?
- Why do you believe this represents an opportunity?

- Are there emerging trends or technologies that could influence the development of these policies?
[if yes] Can you identify these trends or technologies?
- What lessons have been learned from current policies that could guide future policy development?

Conclusion

- **Final comments**
- **Thank you for your time and valuable insights.**
- Do you have any additional thoughts to share, or anything else you would like to discuss?
- Do you have any questions for me?
- **Interest in results**
- Are you interested in receiving the results of the study?

Thank you once again for your participation. Your input is instrumental in enhancing our understanding of physical activity policies in the GCC.

Appendix 10: Participant information sheet for the third study

PARTICIPANT INFORMATION SHEET

Barriers to physical activity in the Southern region of Saudi Arabia - Mixed methods study

WHO IS DOING THE RESEARCH?

My name is Dr Ali Ahmed Alzahrani and I am a PhD student at UTS. My supervisor is Dr Klaus Gebel,
klaus.gebel@uts.edu.au

WHAT IS THIS RESEARCH ABOUT?

The main objective of this study is to identify the barriers to physical activity in adults in the Southern region of Saudi Arabia.

FUNDING

This project is kindly supported through a PhD scholarship from the King Faisal Medical City in Saudi Arabia and PhD funding from the Faculty of Health of the University of Technology Sydney.

WHY HAVE I BEEN ASKED?

You have been invited to participate in this study because you are living in the Southern region of Saudi Arabia. Your contact details were obtained from your GP who works in the health centre that you visited.

IF I SAY YES, WHAT WILL IT INVOLVE?

If you decide to participate, I will invite you to a semi-structured interview

- I will ask you to answer some questions that will take around 45 to 60 minutes to complete. After your permission your answers will be audio recorded.

ARE THERE ANY RISKS/INCONVENIENCE?

Discomfort in discussing barriers to physical activity would be the main risk in this study. To mitigate this risk, I am committed to anonymise the interview transcripts and your data will not be shared with any organisation except my supervisor and UTS. During data analysis and write up of the findings, the interview will be assigned a number code to help ensure that personal identifiers are not revealed.

Another potential risk is that you may be interrupted by an incoming phone call during a Zoom interview. In this case, you will be offered to postpone the interview to a suitable time. If you are a female participant, cultural risk (i.e., contacting a female participant without the presence of a male guardian) will be avoided by conducting interviews via Zoom without using the video. The Zoom meetings will only be audio recorded.

DO I HAVE TO SAY YES?

Participation in this study is voluntary. It is completely up to you whether you decide to take part.

WHAT WILL HAPPEN IF I SAY NO?

If you decide not to participate, it will not affect your relationship with the researchers or the University of Technology Sydney. If you wish to withdraw from the study once it has started, you can do so at any time without having to give a reason by contacting Dr Ali Ahmed Alzahrani, aliahmeda.alzahrani@student.uts.edu.au or Dr Klaus Gebel, klaus.gebel@uts.edu.au

If you withdraw from the study, the recording of your interview will be erased, and the transcripts will be destroyed.

If you decide to leave the research project, we will not collect additional personal information from you, although personal information already collected will be retained to ensure that the results of the research project can be measured properly and to comply with law. You should be aware that data collected up to the time you withdraw will form part of the research project results. If you do not want the researchers conducting the project to do this, you must tell them before you join the research project.

CONFIDENTIALITY

By signing the consent form you consent to the research team collecting and using personal information about you for the research project. All this information will be treated confidentially. The recorded interviews and your transcribed answers to the questions will be stored on the eResearch Store network drive provided by UTS. I and my supervisor, as well as the University of Technology Sydney (UTS Graduate Research School) can access the data. Each interview will be assigned a number code to help ensure that personal identifiers are not revealed during the analysis and write up of findings.

We would like to store your information for future use in research projects that are an extension of this research project. In all instances your information will be treated confidentially.

We plan to publish the results of this study in a peer-reviewed scientific journal. This study will also be a part of my PhD dissertation. In any publication, information will be provided in such a way that you cannot be identified.

WHAT IF I HAVE CONCERNS OR A COMPLAINT?

If you have concerns about the research that you think I or my supervisor can help you with, please feel free to contact us:

Dr Ali Ahmed Alzahrani, aliahmeda.alzahrani@student.uts.edu.au

Dr Klaus Gebel, klaus.gebel@uts.edu.au

You will be given a copy of this form to keep.

NOTE:

This study has been approved in line with the University of Technology Sydney Human Research Ethics Committee (UTS HREC) guidelines. If you have any concerns or complaints about any aspect of the conduct of this research, please contact the Ethics Secretariat on ph.: +61 2 9514 2478 or email: Research.Ethics@uts.edu.au, and quote the UTS HREC reference number. Any matter raised will be treated confidentially, investigated and you will be informed of the outcome.

CONSENT FORM

Barriers to physical activity in the Southern region of Saudi Arabia - Mixed methods study

I _____ agree to participate in the research project **Barriers to physical activity in the Southern region of Saudi Arabia - Mixed methods study** being conducted by *Dr Ali Ahmed*

Alzahrani, alياهوmeda.alzahrani@student.uts.edu.au, [REDACTED] and Dr Klaus Gebel, klaus.gebel@uts.edu.au, +61 2 95144578. I understand that funding for this research has been provided by a scholarship from King Faisal Medical City, Saudi Arabia, and PhD funding from the Faculty of Health of the University of Technology Sydney.

I have read the Participant Information Sheet, or someone has read it to me in a language that I understand.

I understand the purposes, procedures and risks of the research as described in the Participant Information Sheet.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to participate in this research project as described and understand that I am free to withdraw at any time without affecting my relationship with the researchers or the University of Technology Sydney.

I understand that I will be given a signed copy of this document to keep.

I agree to be:

Audio recorded

I agree that the research data gathered from this project may be published in a form that:

Does not identify me in any way

May be used for future research purposes

