

**Challenges and Facilitators Influencing Physical Activity and
Sedentary Behaviour among South Asian Migrant Women in
New Zealand**

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sedentary behaviour among South Asian migrant women in
New Zealand**

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ATTESTATION OF AUTHORSHIP

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgments), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Signed:..........

Wasani Silva

Dated:.....08th December 2016.....

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ABSTRACT

Low levels of physical activity and sedentary behavioural patterns among South Asian migrants, particularly women in Western countries including New Zealand, have been identified as a contemporary public health issue. This issue can pose a significant threat to the wellbeing of this population group as low engagement in physical activity is closely linked to higher prevalence of lifestyle diseases. In the Western part of the world, a significant amount of research has been conducted in the area of physical activity among South Asian migrants, particularly women, exploring barriers and enablers to physical activity. However, in New Zealand, this issue has not been explored adequately.

This research is designed to fill the identified knowledge deficit by answering the research question: what are the challenges and facilitators influencing physical activity and sedentary lifestyle among South Asian migrant women?

Qualitative description was used as the methodology to conduct this research as the main objective of the study was to obtain rich descriptions of participants' challenges and facilitators to physical activity and sedentary lifestyle. Data were collected from eight South Asian migrant women, four Sri Lankans, two Indians and two Pakistanis, using semi-structured interviews. Data were analysed thematically.

In regard to challenges influencing physical activity, five main and two miscellaneous themes emerged from participants' responses. Main themes related to time constraints due to caregiver responsibilities and lack of social and family support, unfavourable weather conditions, financial difficulties, isolation, and lack of clear understanding of sedentary lifestyle and other factors causing sedentary behaviour. Two miscellaneous

themes were also noted: cultural barriers, and religious and spiritual priorities. Most of the barriers are seen as modifiable and they reflect social determinants of health. Three major themes were identified in regard to facilitators influencing physical activity and sedentariness: awareness of the benefits of physical activity, encouragement and moral support from family, and having more opportunities and facilities in New Zealand to engage in physical activity. The findings show that female South Asian migrants in New Zealand are encountering more challenges than facilitators to physical activity.

This thesis introduces a number of recommendations at family, and community and national levels to overcome the identified challenges and to strengthen the recognised facilitators influencing physical activity and sedentary lifestyle.

Considering the benefits of the research for the public health arena, the findings can be used to increase individual and community awareness about ways to improve the engagement in physical activity among South Asian migrant women. The findings also highlight the importance of empowering South Asian women to take actions for themselves. The proposed suggestions may also be used to draw public health policy makers' attention to the necessity of initiating more culturally and gender-appropriate public health programmes to increase the level of physical activity among South Asian female migrants which, in the long run, will aid to minimise the burden of lifestyle illnesses among them. This research may also facilitate further research in the area of physical activity and sedentary lifestyle, and South Asian health.

CHAPTER ONE: INTRODUCTION TO THE STUDY

If we could give every individual the right amount of nourishment and exercise, not too little and not too much, we would have found the safest way to health.

-Hippocrates, *Hippocratic Writings*, 5th century BC

1.1 Background

South Asian migrants, particularly women, in developed countries including New Zealand are found to be less physically active and are more sedentary than Europeans and other ethnic groups (Garduño-Díaz & Khokhar, 2012; Kolt, Schofield, Rush, Oliver & Chadha, 2007; Mohanty, Woolhandler, Himmelstein & Bor, 2005). Low engagement in physical activity and sedentary lifestyle are seen as closely associated with higher prevalence of lifestyle diseases such as type 2 diabetes and cardiovascular illnesses among South Asian migrants in Western countries (Daniel, Wilbur, Marquez & Farran, 2013; Gujral, Pradeepa, Weber, Narayan & Mohan, 2013; Scragg & Maitra, 2005). The studies conducted in developed countries have identified a number of barriers and enablers influencing the level of physical activity and sedentariness. However, there is little research about this issue in New Zealand.

Attempting to fill the identified knowledge gap, this thesis explores the challenges and facilitators influencing physical activity and sedentary lifestyle among South Asian migrant women in New Zealand. Using qualitative descriptive methodology, eight South Asian women were interviewed to obtain rich descriptions in order to find the answers to the proposed research question.

This chapter introduces the research topic. Providing a context for the research, first, an overview of South Asia is provided, and South Asian diaspora and global migration patterns of South Asians are discussed. South Asian migrants in New Zealand and the

available statistical information about this ethnic group are also discussed. The socioeconomic and health status of South Asians is explored providing a snapshot of the burden of lifestyle diseases. The chapter succinctly discusses the level of physical activity and sedentary lifestyle among South Asians, which is seen as closely associated with developing lifestyle diseases. The theoretical concepts of physical activity and sedentary lifestyle that are relevant to this study are further discussed highlighting the contemporary notion of sedentariness. The impetus to undertake this research is explained and the research question is stated. The chapter then outlines the significance of this research in the arena of public health. Finally, the structure of the thesis is explained.

1.2 An overview of South Asia

Being one of the most dynamic territories in the globe, South Asia is the home to eight countries including Nepal, India, Pakistan, Sri Lanka, Maldives, Bangladesh, Afghanistan and Bhutan (South Asian Association for Regional Cooperation [SAARC], 2009; World Bank Group, 2016). Figure 1 illustrates the map of these South Asian countries and Myanmar. As Myanmar is not usually included in the definition of South Asia, it is not included in this study.



Figure 1. The map of South Asian countries and Myanmar. Reproduced from Who are South Asians, In *South Asian Concern*, 2016, Retrieved October 24, 2016, from <http://www.southasianconcern.org/south-asians/who-are-south-asians/>. Copyright 2016 by South Asian Concern. Reproduced with permission.

These countries are connected economically, socially and culturally by the SAARC (SAARC, 2009; South Asian Concern, 2016). Afghanistan was recognised as a South Asian country in 2006 and the country officially joined the SAARC in 2007 (SAARC, 2009). Even though South Asia has never been a coherent geopolitical region, it has a discrete geographical identity (South Asian Concern, 2016). Table 1 highlights some key information about South Asian countries: capitals, area, population as per 2015, gross domestic product in 2015 and official languages. When comparing with other South Asian countries, India has the largest territory, the highest population and the highest gross domestic product. Also, a significantly higher number of languages are spoken in India.

Table 1

Key Facts about South Asian Countries

Country	Capital	Area (km ²)	Population (2015)	Gross Domestic Product (2015)	Official languages
Afghanistan	Kabul	652,864	32.53 million	\$19.20 billion	Pashto, Dari
Bangladesh	Dhaka	147,570	161.0 million	\$195.1 billion	Bangla
Bhutan	Thimphu	38,394	774,800	\$1.962 billion	Dzongkha
India	New Delhi	3,287,263	1.311 billion	\$2.074 trillion	Hindi & 22 other
Maldives	Male	298	409,200	\$3.143 billion	Maldivian
Nepal	Kathmandu	147,181	28.51 million	\$20.88 billion	Nepali
Pakistan	Islamabad	881,913	188.9 million	\$270.0 billion	English, Urdu
Sri Lanka	Sri Jayawardenepura Kotte	65,610	20.97 million	\$82.32 billion	Sinhala, Tamil

Data in Table 1 derived from three sources: World Bank Group 2015; Central Intelligence Agency, 2015; Wikipedia, 2016.

South Asia plays an integral role in the global development (World Bank Group, 2016; South Asian Concern, 2016). According to the World Bank Group (2016), the world's largest working-age population and a quarter of the world's middle class consumers live in South Asia. While South Asia is experiencing a long period of sturdy economic growth, poverty is still a major concern. Furthermore, the World Bank Group (2016) outlines that about 399 million people in South Asia live with an average daily income of less than \$1.25. Moreover, over 200 million South Asians live in slums, and 0.5 billion have no power supply. Malnutrition is also an alarming health issue in South Asia. The World Bank Group (2016) also points out that many South Asian countries suffer from social exclusion and increasing inequality due to political unrest, cross-border conflicts and security concerns.

1.3 South Asian diaspora and international migration patterns

Over 20 million South Asians are living outside of their motherlands, and are scattered around the world (South Asian Concern, 2016). According to South Asian Concern (2016), this international migration from South Asia started in the 19th and early 20th centuries and the British Empire was seen as the major driving force. Highlighting the key stages of the labour migration history, initially, South Asians migrated to South Africa, the Caribbean, Fiji, South America and Malaya to work in plantations. Some South Asians migrated to Central and East Africa to work on the railways. This initial phase was followed by mass immigration of professionals and labourers to Britain and the United States of America (US) in the 1950s and 1960s. Following the expulsion of Asians from East Africa in the early 1970s, a large number of South Asian professionals migrated to Western countries. Since then, South Asians have been continually migrating to Western destinations (South Asian Concern, 2016).

According to the World Bank Group (2015), India, Bangladesh, Pakistan and Afghanistan were identified as some of the top migrant source countries. Statistics from 2015 show that immigrants from South Asia amounted to 37.1 million, of whom 20.6 % were living in countries belonging to the Organization for Economic Cooperation and Development (OECD) such as Australia, New Zealand, Ireland, and the US (World Bank, 2015).

The “brain drain”, the migration of skilled workers, has been a common trend in the South Asia-West migration (Dodani & LaPorte, 2005; United Nations, 2013). Better living arrangements, higher wages, better education for children, access to advanced technology and more stable political conditions in Western countries attract skilled professionals from developing territories like South Asia (Dodani & LaPorte, 2005).

This phenomenon is more pronounced for women than for men (United Nations, 2013). Statistics from the period from 2010 to 2011 show that more tertiary-educated women were living outside their country of origin than men (United Nations, 2013). For instance, in regard to skilled Maldivian migrants, this difference was up to 10 percentage points in the period from 2010 to 2011 (United Nations, 2013).

1.4 South Asian migrants in New Zealand

Over the past 20 years, New Zealand has become more ethnically and culturally diverse (Ministry of Social Development, 2008). South Asians are considered one of the fast-growing population groups in New Zealand (Rasanathan, Ameratunga & Tse, 2006; New Zealand Government, 2014). According to the 2013 Census, the largest South Asian populations were Indian, Sri Lankan and Pakistani ethnic groups comprising 155,178, 11,274 and 3,261 people respectively (New Zealand Government, 2014). The highest concentration of these South Asian groups are found in Auckland (New Zealand Government, 2014). Moreover, statistics show that Indian and Sri Lankan populations in New Zealand have increased by 48.4% and 35.6% respectively from the period from 2001 to 2006 to the period from 2006 to 2013 (New Zealand Government, 2014).

The Government statistics show that a significant number of skilled migrants to New Zealand are from South Asian countries, particularly from India (Ministry of Business, Innovation and Employment, 2015a). According to the Ministry of Business, Innovation and Employment (2015a), in the period from 2014 to 2015, India was identified as the largest source of skilled immigrants. Twenty one percent of the applicants who were granted skilled migrant visas during this period were Indians (Ministry of Business, Innovation and Employment, 2015a). Compared with the period from 2013 to 2014, in the period from 2014 to 2015, an enormous increase of 42% is seen in the number of

international students from India (Ministry of Business, Innovation and Employment, 2015a). Statistics regarding migrants from other South Asian countries are not highlighted in the Ministry website. However, the statistics about Indian migrants show that South Asians are increasingly becoming a key population group in New Zealand.

1.5 Living and health conditions of South Asian migrants in New Zealand

Three major national health surveys conducted in the periods of 2002-2003, 2006-2007 and 2011-2013 have explored the health status and the living conditions of South Asians in New Zealand (Scragg & Maitra, 2005; Scragg, 2010; Scragg, 2016). However, it is not clear whether the term “South Asian” in the surveys were referring solely to South Asian migrants or to all South Asians including migrants and people of South Asian descent who were born and brought up in New Zealand. Rasanathan, Craig and Perkins (2006) state that the term “Asian” is often not well understood. Even though there is a popular assumption that Asians in New Zealand were all born in Asia, one in five were born in New Zealand (Ho, 2015). Similarly, it appears that the term South Asian is also not clearly defined in the literature. However, as only little information was found that clearly refers to South Asian migrants, and as a greater percentage of South Asians are South Asian migrants, the data about South Asians are considered as relevant to this research.

1.5.1 Socio-economic status

According to the health survey conducted in the period of 2006-2007, more South Asians were living in low socioeconomic decile areas than New Zealand Europeans (Scragg, 2010). In the period from 2006 to 2007, 36% of South Asians lived in NZDep (New Zealand deprivation index) quantile seven and eight and a further 22% lived in NZDep quantile nine and ten (Scragg, 2010). Compared to other Asian people, more

South Asians were living in the lowest NZDep quantile areas (Scragg & Maitra, 2005). Goodyear & Fabian (2014) report that only a small percentage of South Asians in New Zealand are property owners and they are more likely to live in rental accommodation.

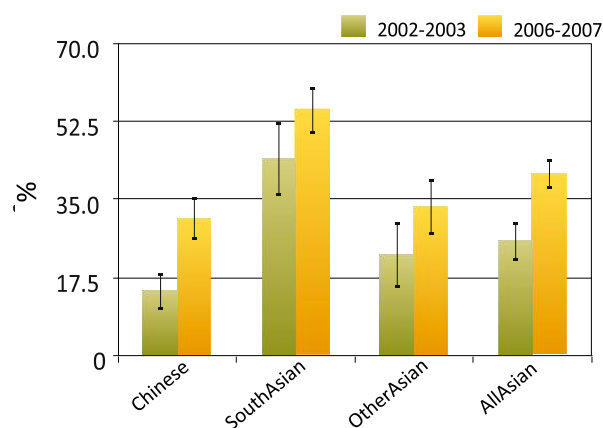
As a significant portion of South Asian migrants are entering New Zealand as skilled migrants, given the criteria in New Zealand for skilled migration, most of the principal South Asian applicants have a tertiary education qualification (Scragg, 2010). Despite the fact that a higher level of education is observed among the South Asian community in New Zealand with a significant proportion of South Asians having university bachelor or post-graduate degrees, only 38% of South Asians were earning more than \$70000 during the last 12 months in the period of 2006-2007 (Scragg, 2010). The proportion in the highest two household income categories (more than \$70,000 annually) for South Asians decreased from 64% in the period of 2006-2007 to 48% in the period of 2011-2013 (Scragg, 2016). The 2006-2007 survey also revealed that only 31% of South Asians received government income support and only 33% of South Asians had health insurance (Scragg, 2010).

1.5.2 Burden of lifestyle diseases

In regard to South Asian health status, Asian health surveys revealed that South Asians in New Zealand are more at risk of developing lifestyle diseases than other population groups (Scragg & Maitra, 2005; Scragg, 2010; Scragg, 2016). The trends in South Asian health in New Zealand during 2002-2003, when compared with Chinese (9%), show that more South Asians (14%) were diagnosed with hypertension (Scragg & Maitra, 2005). Compared with Europeans, South Asians were twice as likely to have commenced drug treatment for hypercholesterolaemia (Scragg, 2010). During the period of 2002/2003, the prevalence of being on treatment for high cholesterol was highest in

South Asians (12%), intermediate in South-East Asians (6%), and lowest in Chinese (3%) and Koreans (0%). Moreover, during 2002-2003, the prevalences of heart disease (11%), diabetes (14%) and asthma (16%) were highest in South Asians (Scragg & Maitra, 2005). The Ministry of Health (MoH) (2006) also outlines that Indian females in New Zealand have higher ischemic heart disease mortality than Chinese females.

When investigating obesity as a risk factor for developing lifestyle illnesses among South Asians, particularly among South Asian women, 50% of female South Asians were obese in the period of 2002-2003 and by the period of 2006-2007, this was increased to 52% (Scragg, 2010). Moreover, as shown in the below graph, both health surveys conducted in 2002-2003 and 2006-2007 reported that South Asians were more obese than other Asian ethnicities (Scragg, 2010).



*Figure 2. Prevalence of obesity (BMI \geq 25.0) among Asians in New Zealand aged \geq 15 (2002-03 and 2006-07 surveys). Reproduced from *Asian Health in Aotearoa in 2006 - 2007: Trends Since 2002-2003*, by R. Scragg, 2010, Auckland, New Zealand: Northern District Health Board Support Agency, retrieved from <http://www.asianhealth.govt.nz/.../Asian%20Health%20Trends%20Scragg%202010.pdf> Copyright 2010 by R. Scragg. Reproduced with permission.*

1.6 Level of physical activity and sedentary lifestyle

In regard to physical activity and sedentary lifestyle, the 2006-2007 health survey shows that South Asians (46%) were less physically active and were more sedentary compared with New Zealand Europeans (54%) (Scragg, 2010). Investigating the prevalence of physical activity in the last seven days in the periods of 2011-2012 and 2012-2013, only 45% of adult female South Asians and 48% of adult South Asian males were physically active (Scragg, 2016). A report by Rasanathan, Tse, et al. (2006) state that South Asian women show poor engagement in physical activity when compared to other female Asians and male South Asians which can be a risk factor for developing lifestyle diseases.

The study conducted by Kolt et al. (2007) which investigated physical activity and body fatness among Indian migrants in New Zealand revealed that, in terms of recommendations for daily accumulated physical activity, 48% of the South Asian participants were categorised as sedentary and 33% as low active. Kolt et al. (2007) also claimed that physical activity levels decreased even further when migrant South Asian Indians had lived in New Zealand for longer. The next section further explores the theoretical concepts of physical activity and sedentariness.

1.6.1 Physical activity

Physical activity is defined as any skeletal muscular movement in the body that requires energy expenditure (Caspersen, Powell & Christenson, 1985; World Health Organization [WHO], 2016). Different types of physical activity include:

- Incidental activity- activities which are built up in small amounts over the day such as walking up the stairs or to the bus stop.
- Organised activity- activities which are done for the sole purpose of exercising.

- Leisure time activity- activities which are performed during recreation or any time other than those associated with one's regular occupation, housework, or transportation.

(Kandula & Lauderdale, 2005; Queensland Government, 2005; MoH, 2016; WHO, 2016).

National Heart, Lung, and Blood Institute (2016) considers aerobic, muscle-strengthening, bone-strengthening, and stretching are as key forms of physical activity. Running, swimming, walking and bicycling are some of the examples of aerobic activity and over time, regular aerobic activity improve the functions of cardiovascular and respiratory systems (National Heart, Lung, and Blood Institute, 2016). Muscle-strengthening activities like doing pushups and situps, lifting weights and climbing stairs improve the strength, power, and endurance of muscles (National Heart, Lung, and Blood Institute, 2016). Running, walking, jumping rope, and lifting weights are few examples of bone-strengthening activities which make bones stronger (National Heart, Lung, and Blood Institute, 2016). Stretching such as touching toes and yoga exercises improve the range of motion of joints (National Heart, Lung, and Blood Institute, 2016).

The WHO (2016) supports that it is necessary to differentiate the term "physical activity" from the term "exercise", a subcategory of physical activity that refers to planned, structured and repetitive activities, aiming to improve or maintain one or more components of physical fitness (WHO, 2016).

The MoH (2016) emphasises that physical activity brings numerous positive health outcomes including reducing the risk of developing non-communicable lifestyle diseases such as type 2 diabetes, cardiovascular illnesses, cancers. Furthermore,

physical activity strengthen bones and muscles, improve mood and mental health, enhance total well-being and increase life span (Centers for Disease Control and Prevention [CDC], 2015). Insufficient physical activity was identified as a leading risk factor for worldwide mortality, causing an estimated 3.2 million deaths globally (WHO, 2016).

In regard to the amount and type of physical activity appropriate for adults (18-64 year-olds), the WHO (2016) recommends a minimum of 150 minutes of moderate-intensity physical activity throughout the week, or at least 75 minutes of vigorous-intensity physical activity throughout the week, or an equivalent combination of moderate- and vigorous-intensity activity. For additional health benefits, it is also advised to increase the moderate-intensity physical activity to 300 minutes per week or equivalent (WHO, 2016).

1.6.2 Sedentariness

Sedentariness is identified as a major risk factor for developing lifestyle illnesses. According to the Auckland District Health Board (ADHB) (2006), among individuals who are leading a sedentary life, the risk of dying from cardiovascular disease is 1.9 times higher than among people who are physically active, irrespective of other risk factors. Research on the issue of sedentary behaviour is expanding rapidly (Biddle, Gorely, Marshall & Cameron, 2009). In early days, sedentary behaviour was recognised as not meeting a criterion level of physical activity (Biddle et al., 2009). For instance, individuals were categorised as sedentary when they did not meet the criterion of 30 minutes of moderate-intensity activity on all or most days of the week (United States Department of Health and Human Services, 1996). Similarly, Tremblay (2012) also points out that in sport and exercise literature, sedentarism is referred to as the absence

of some threshold of moderate to vigorous physical activity. Moreover, a more conventional view relates sedentary behaviours mainly to technology-based behaviours such as television viewing, online shopping using computers and playing computer games (Biddle et al., 2009).

The contemporary understanding of the sedentary behaviour is that it may be relatively independent of physical activity (Biddle et al., 2009). One can be physically active and yet sedentary. For instance, a study conducted by Sugiyama, Healy, Dunstan, Salmon and Owen (2008) revealed that leisure-time sedentary behaviour was high among some participants despite the fact that they had adequate levels of leisure-time physical activity. The findings also identified a higher tendency of being obese or overweight among participants, particularly women, who were sufficiently physically active but had high levels of sedentariness (Sugiyama et al., 2008). Supporting this view, Biddle (2004) states that “physical inactivity” merely indicates the absence of performing sufficient amounts of physical activity and it doesn’t grasp the complexity of sedentarism; hence, the term does not adequately explain the patterns of sedentary behaviour. Recent studies point out that, to understand sedentariness, not only the types of movement but also the energy cost are important (Biddle, 2004). According to the contemporary notion, Tremblay (2012) identifies sedentary behaviour as any waking behaviour characterised by an energy expenditure equal to or less than 1.5 metabolic equivalents (METs) while in a sitting or reclining posture. Exploring the studies carried out on physical activity and sedentary behaviour among South Asian migrants in New Zealand, it is seen that the modern concept of being “physically active and yet sedentary” has not been explored.

1.6.3 Relevance of the theoretical concepts of physical activity and sedentariness to the research

While aiming to reveal challenges and facilitators to physical activity and sedentary lifestyle, the researcher attempts to uncover South Asian women's understanding of these concepts. The study also seeks to explore the participants' awareness of the contemporary view of the sedentarism.

1.7 The impetus to conduct this research

The literature shows that South Asians in New Zealand have low levels of physical activity and high sedentariness and it is also reported that engagement in physical activity among South Asian women is lower compared to South Asian males and other Asian and European women (Kolt et al., 2007; Scragg & Maitra, 2005; Scragg, 2010; Scragg, 2016). As poor exercise patterns and high sedentary behaviour among South Asian migrants, particularly women in the Western countries, are identified as modifiable risk factors for higher prevalence of lifestyle diseases, it is evident that the roots of this issue should be further explored (Daniel & Wilbur, 2011; Hine, Fenton, Hughes & Velleman, 1995; Kolt et al., 2007; Misra, Endemann & Ayer, 2005).

As a South Asian female migrant and a health professional, my passion for exploring contemporary public health issues among South Asian migrant women in New Zealand was the driving force to undertake this study. When selecting the research topic, the area of physical activity and sedentary lifestyle caught my attention as with my clinical knowledge and work experience, I am well aware that South Asian females are at high risk of developing lifestyle illnesses such as type 2 diabetes and hypertension if they are less physically active. This understanding motivated me to explore the challenges and facilitators influencing physical activity and sedentary lifestyle among South Asian

migrant women in New Zealand. The familiarity of the South Asian culture enabled me to undertake a culturally appropriate research study to obtain findings which aid to fill the identified knowledge gap.

1.8 Research question

What are the challenges and facilitators influencing physical activity and sedentary lifestyle among South Asian migrant women in New Zealand?

1.9 Significance of the research in the arena of public health

I believe that the findings of this study can be used to draw policy makers' attention to the necessity of initiating culturally and gender-appropriate public health policies and programmes to overcome the identified challenges influencing physical activity and sedentary lifestyle. The information about recognised enablers to physical activity may be used to implement strategies to strengthen these facilitators to enhance the current level of physical activity among South Asian migrant women. Measures aimed at improving the level of physical activity, in the long run, may aid to reduce the burden of preventable or modifiable chronic lifestyle diseases such as type 2 diabetes and cardiac pathologies among South Asian migrants. Consequently, this may help to decrease the budget allocated for health services related to these lifestyle illnesses. The research may also provide the foundation for on-going research on less explored aspects of the issue of physical inactivity and sedentariness among South Asian migrants such as seeking an explanation for the relationship between low levels of physical activity and time spent in New Zealand, which was pointed out in the study conducted by Kolt et al. (2007).

It is hoped that collectively, these measures would eventually assist female South Asian migrants to enjoy more healthy and productive lives in New Zealand. Consequently, as

the centre of the family, healthy and productive women can positively influence the health and living conditions of South Asian New Zealanders as a whole.

1.10 The structure of the thesis

The content of this thesis is divided into five chapters. Chapter one introduces the research topic providing an overview of the main aspects of the topic such as South Asia, South Asian diaspora, New Zealand context of South Asian migrants, their health and living conditions and the level of physical activity and sedentary lifestyle. This chapter also introduces the research question, explains the impetus to undertake the research and finally, discusses the significance of the research for public health.

The second chapter explores the past and current literature on the issue of physical activity and sedentariness among migrant South Asians. This section discusses three main aspects of the issue looking at both the global and New Zealand context: the level of physical activity and sedentary lifestyle among South Asian migrants; the link between high burden of lifestyle diseases and low levels of physical activity among South Asian migrants; and the barriers and enablers influencing physical activity and sedentary lifestyle among migrant South Asians, particularly females. The chapter then identifies the knowledge gap in the literature.

The third chapter provides the rationale for qualitative description as the methodology for this research. Furthermore, the research methods used in sampling, participant recruitment, data collection and data analysis are described and justified. The chapter discusses the ethical and cultural considerations involved in this research. The measures taken to maintain rigour of the study are also outlined.

Chapter four describes the research findings on the identified challenges and facilitators influencing physical activity and sedentary behaviour. The themes that emerged from the data analysis are described. The final, fifth, chapter provides an in-depth discussion of the study findings and recommendations. Strengths and weaknesses of the research are also stated.

CHAPTER TWO: A LITERATURE REVIEW

*Better to hunt in fields, for health unbought,
Than fee the doctor for a nauseous draught,
The wise, for cure, on exercise depend,
God never made his work for man to mend.*

-John Dryden, *To My Honoured Kinsman*, 1699

2.1 Introduction

A wide variation is seen in the prevalence of physical inactivity among adult South Asians within and between countries (Ranasinghe, Ranasinghe, Jayawardena & Misra, 2013). South Asian migrants, particularly women, in developed countries including New Zealand are found to be less physically active and are more sedentary than other ethnic groups (Garduño-Díaz & Khokhar, 2012; Kolt et al., 2007; Mohanty et al., 2005). The topic of physical activity and sedentary lifestyle among South Asian migrants in the Western world has been researched globally since the 1990s, exploring main aspects of this contemporary public health issue. This chapter critically reviews these research findings in light of the global and New Zealand context.

The term “South Asian migrants” refers to immigrants from India, Bangladesh, Sri Lanka, Bhutan, Pakistan, Nepal, Maldives, and Afghanistan (World Bank Group, 2016). As discussed in the first chapter, in some of the literature reviewed in this section, the term South Asian is used and it is not clear if the term refers only to South Asian migrants or South Asians as a whole, including South Asian migrants and their descendants who were born and brought up in Western countries. However, the findings revealed by these studies are considered as relevant to the thesis as a significant proportion of South Asians in developed countries, including New Zealand, are South Asian migrants (Ho, 2015).

Databases at the Auckland University of Technology's library were used to carry out the literature review. The main source was the EBSCO Health Databases and peer reviewed articles from MEDLINE and CINAHL Plus with full text via EBSCO. In addition, Scopus and Google Scholar were utilised in search of information. The key words used to search the literature were: physical activity, sedentary lifestyle, South Asian migrants, women, and challenges and facilitators, in various combinations from 1995 to 2016. Thirteen studies conducted in English language were selected as the main sources. A number of other articles with supporting evidence were also used.

Table 2 summarises the key features of the main studies- main objective, study sample, methodology and methods, a summary of the key findings and the location. The studies are set out in the table by the year they were conducted, starting from the 1990s. Of the 13 main studies, five are quantitative, three are qualitative, one is a mixed methodology study and four are systematic reviews of the databases.

Table 2

Key Features and Findings from the Literature Review

Author/s	Main objective	Sample	Methodology and methods	Summary of the outcomes	Location of the study
Hine, Fenton, Hughes & Velleman 1997	<p>To explore the link between cardiovascular diseases (CVDs) and physical activity (PA) in female South Asians (SAs) in the United Kingdom (UK)</p> <p>To identify exercise facilities and more ways for SA women to become physically active</p>	52 SA participants	<p>Quantitative survey</p> <p>Face-to-face interviews</p>	<p>Showed low levels of PA among SA women, particularly Pakistani women.</p> <p>Barriers to PA identified among female SAs -</p> <ul style="list-style-type: none"> • Improper self-assessment of health status • Limited knowledge of English • Low economic status • Cultural barriers <p>Found a link between higher prevalence of coronary heart diseases (CHDs) and lower levels of PA among female SA migrants, particularly Pakistani women.</p>	UK
Hayes et al 2002	To investigate the patterns of PA and the link with risk factors for diabetes mellitus (DM) and CVDs in Pakistanis, Bangladeshis, Indians and Europeans in the UK	<p>Residents of Newcastle:</p> <p>709 SA participants</p> <p>825 European participants</p>	Quantitative cross-sectional, population-based research using a questionnaire	<p>Indians, Pakistanis or Bangladeshis were less physically active than Europeans.</p> <p>The study found that low levels of PA is closely associated with higher prevalence of CVDs and DM in these populations.</p> <p>Identified a need for strategies to improve PA in SAs.</p>	UK
Lawton, Ahmad, Hanna, Douglas & Hallowell 2002	To investigate challenges to PA among Indian and Pakistani migrants with type 2 DM, living in the UK	9 Indian and 23 Pakistani patients with type 2 DM	Qualitative face-to-face interviews	<p>Participants were aware of the need to be physically active.</p> <p>However, lack of putting the knowledge into practice is seen.</p> <p>Challenges such as time constraints were interconnected with social expectations and cultural norms.</p>	UK

				A need for culturally appropriate measures which capitalise on the types of PA already performed by SA migrants in their day-to-day lives is identified.	
Misra, Endemann & Ayer 2005	To investigate the association between physiological indices of metabolic syndrome and the intensity and duration of leisure time physical activity (LTPA) in Indian migrants in Northern California	56 Indian migrants	Quantitative cross-sectional study Minnesota LTPA questionnaire was used to determine LTPA Standard procedures were used to record anthropometric measurements	Respondents reported low levels of LTPA and women were less active than men. A favourable risk factor profile was identified for metabolic syndrome among Indians who are physically active. The study highlighted the necessity to improve PA in Indian immigrants, especially women, to decrease the rates of metabolic syndrome.	Northern California
Sriskanharajah & Kai 2006	To investigate attitudes towards and influences on PA among British SA women with DM and CHD to explore secondary prophylactic measures	15 British SA patients with CHD and DM	Exploratory qualitative research study using face-to-face semi-structured interviews	The study found that the fact that PA helps to limit progression of their disease was unrecognised to a greater extent by the respondents. Participants lack certainty about the type of PA appropriate and safe for them. Lack of definite advice from clinicians about PA is identified as a barrier to PA.	UK
Kolt, Schofield Rush, Oliver & Chadha	To investigate PA, body fatness and nutritional behaviours in Asian Indian	112 Asian Indian participants-	Quantitative Design	The study found Indian migrants to be less physically active and more obese.	NZ

2007	immigrants to New Zealand (NZ)	50 males and 62 females	<p>Methods of data collection:</p> <p>Body mass index (BMI) and central adiposity were determined using measured height, weight, and waist circumference</p> <p>Percentage of body fat was determined using bioelectrical impedance</p> <p>Daily steps taken was recorded with Pedometer</p>	<p>Compared to their female counterparts, males had higher levels of PA and a higher variability in daily pedometer step counts.</p> <p>According to recommendations for daily accumulated PA, 48% of the sample was classified as sedentary and 33% as low active.</p> <p>The level of PA was lower for migrants who were in NZ for a longer duration.</p> <p>Females had a higher body mass index than males</p> <p>69% of the participants were obese ($BMI \geq 25 \text{ kg/m}^2$)</p> <p>13.7% were overweight.</p> <p>Average percentage of body fat for females was significantly higher than males.</p> <p>Majority of the sample (74.4%) were classified as less physically active, and were suffering from lifestyle illnesses.</p>	
Babakus & Thompson, 2012	To assess the current knowledge about the PA level and sedentary time (ST) of female SAs	26 quantitative and 12 qualitative studies	Mixed review (systematic and integrative)	<p>Quantitative studies showed low engagement in PA among female SAs compared with both their male counterparts and European populations.</p> <p>Recommended amounts of PA for positive health outcomes were not met by female SAs.</p> <p>Qualitative studies identified cultural and structural challenges to PA.</p>	UK

				<p>Low level of understanding of the recommended amounts of PA was also seen as a barrier.</p> <p>Faith and education were seen as enablers.</p>	
Jepson et al 2012	To explore motivations and facilitators to PA among SAs in Scotland	59 SA participants	Qualitative methodology using in-depth interviews and focus groups with participants who were selected purposively	<p>Main enablers for undertaking PA were external motivators.</p> <p>Main external motivators identified:</p> <ul style="list-style-type: none"> • Reduce body weight enhancing physical and mental health. • The study pointed out that the social context of people's lives should be taken into consideration when attempting to promote PA among SAs. <p>Group activity is seen as important to improve the level PA and can be enabled through community, religious or family networks.</p>	Scotland
Garduño-Díaz & Khokhar 2012	<p>To investigate the prevalence of type 2 DM and its complications</p> <p>Also to investigate the risk factors linked with type 2 DM among migrant SAs</p>	152 articles in total (using quantitative (mainly) and qualitative studies)	Literature review using international database	<p>Physical inactivity was identified as a key risk factor associated with higher rates of type 2 DM.</p> <p>Lower PA levels were found among SA immigrants compared to migrants of Afro-Caribbean origin.</p> <p>Identified that lack of reliable methods for PA assessment limits the progression of the prophylactic measures and necessary interventions.</p>	UK
Lucas, Murray & Kinra 2012	To review the qualitative study findings regarding health beliefs and	10 studies in total (mainly qualitative)	Search of central databases	In regard to PA behaviour, female SA migrants exhibited less behavioural control.	UK

	perceptions of adult British SAs	studies)		<p>Even though some participants were aware of importance of PA for health benefits, preventing diseases by adopting an active lifestyle was not a prioritised goal.</p> <p>Cultural and social factors are seen as closely associated with the engagement in PA.</p>	
Daniel, Wilbur, Marquez & Farran 2013	To compare the levels of PA between male and female SA migrants in the Chicago metropolitan area	110 SA participants	Quantitative descriptive-cross-sectional survey	<p>The study showed that 51.8 % of the sample met the recommended PA guidelines for LTPA.</p> <p>The average daily steps count was in the “low active” classification for SA men and women.</p> <p>SA women were less physically active than men.</p> <p>The study identified a need for gender- and culturally appropriate measures to improve the level of PA among SAs.</p>	US
Caperchione, Chau, Walker, Mummery & Jennings 2015	To explore gender-related perceptions of challenges and facilitators to PA in Indian Punjabis in Western Canada	204 SA Punjabi participants	<p>Quantitative and qualitative methods</p> <p>Computer-assisted telephone interview survey + Face-to-face interviews with randomly selected participants</p>	<p>The study revealed that female SA Punjabis more often identified time constraints due to work and family, and a lack of motivation as barriers to PA.</p> <p>For Punjabi men, climate was identified as a main challenge to PA.</p> <p>Reducing body weight and looking like others were main facilitators to PA for Punjabi women.</p> <p>The study found that gender-associated differences concerning PA are present in this population and concluded that these differences should be taken into consideration in implementing appropriate interventions to improve the level of PA.</p>	Western Canada
Fernandez et al 2015	To explore migratory implications for CHD risk prevention in Indian migrants in Australia	19 studies	Database search and integrative review methodology	The study found an association between low levels of PA and higher rates of CHD among migrant Indians in Australia.	Australia

				Also found that Indian females were suffering more from hypercholesterolaemia, hypertriglyceridaemia and hypertension compared to Caucasian females.	
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The main objective of this chapter is to review the literature regarding the level of physical activity and sedentary lifestyle among South Asian migrants in the Western world including New Zealand. The chapter discusses three major aspects of the topic that have emerged from the literature. First, the level of physical activity and sedentary lifestyle among South Asian migrants in developed countries are explored. Secondly, the link between chronic health conditions among South Asian migrants and their level of physical activity is examined, drawing particular attention to the current burden of lifestyle diseases among migrant South Asians in New Zealand. Then, challenges and facilitators to physical activity and sedentary lifestyle among South Asian migrants, particularly women, are discussed. The recommendations for areas to consider in addressing this issue identified by the past studies to overcome recognised barriers are also outlined. Finally, the chapter recognises the deficit in the current knowledge in regard to the research topic.

2.2 Level of physical activity and sedentary lifestyle among South Asian migrants in developed countries

2.2.1 Global context

The prevalence of physical inactivity among South Asians within and between countries varies significantly (Ranasinghe et al., 2013). Research has been carried out to investigate the level of physical activity and sedentary lifestyle among South Asian migrants in Western countries. The majority of this research was conducted in the UK. Overall, the studies found that the prevalence of physical inactivity among South Asian migrants, particularly women, is higher than in Europeans. It is also seen that the modern conceptualisation of the issue of sedentariness is investigated inadequately. This section first discusses the study findings of the prevalence of physical inactivity among South Asian migrants as a whole. Secondly, the findings, which highlight the level of

physical activity among South Asian male migrants, are outlined. The chapter then explores the issue of low engagement in physical activity among South Asian migrant women, comparing the findings with their male counterparts and women of other ethnicities. Finally, the topic of sedentariness among South Asian migrants is discussed.

Level of physical activity among South Asian migrants in Western countries

Findings for migrant South Asians as a whole

Exploring the level of physical activity among South Asian migrants, a systematic literature review was conducted using international databases comparing the health status and lifestyle of the minority populations in various countries (Garduño-Díaz & Khokhar, 2012). The review outlined that South Asian immigrants in developed countries were less physically active compared to other migrant groups, particularly migrants of Afro-Caribbean origin (Garduño-Díaz & Khokhar, 2012). However, statistical data about the levels of physical activity in various developed countries were not available in this literature review as the main focus of the review was to explore the prevalence and risk factors linked with lifestyle diseases (type 2 diabetes) among South Asian migrants.

Further exploring physical activity among migrant South Asians in developed countries, a cross-sectional descriptive survey was conducted to examine the level of physical activity among Indian migrants in the Chicago metropolitan area of the US (Daniel et al., 2013). Participants wore a Lifecorder EX accelerometer for a week to obtain information about their weekly activity (Daniel et al., 2013). The study revealed that only just over half (51.8%) of the participants met the recommended physical activity guidelines, and the average number of daily step count (5,000–7,499 steps) was in the “low active” classification (Daniel et al., 2013).

Two other research studies conducted in the US support the findings revealed by Daniel et al. (2013). Indian migrants in the US were found to have considerably lower levels of habitual physical activity than their Western counterparts (Mohanty et al., 2005). A cross-sectional study conducted by Misra et al. (2005) investigating the association of intensity and duration of leisure time physical activity to endocrine health problems in Asian Indian immigrants in Northern California, showed that the majority of participants had low engagement of leisure time physical activity. Leisure time physical activity was determined by obtaining information about activities like walking, using stairs when an elevator is available and bicycling, which were performed during recreation in the previous 12 months (Misra et al., 2005; National Cancer Institute, 2016).

Highlighting the findings for South Asian men

A population-based cross-sectional study conducted in Newcastle (UK) revealed that 71% of Indian men, 88% of Pakistani men and 87% of Bangladeshi men did not meet current guidelines for participation in physical activity, compared with 52 % of male Europeans (Hayes et al., 2002). Moreover, this study showed that Europeans in Newcastle were significantly more active than all South Asian populations combined (Hayes et al., 2002). Forty eight percent of European men were found to be performing 30 minute episodes of at least moderate activity on most days of the week, compared to 18% of South Asian men (Hayes et al., 2002).

Prevalence of physical inactivity among South Asian females

The study conducted by Hayes et al. (2002) showed low levels of physical activity among Indian, Bangladeshi and Pakistani women compared with female Europeans in Newcastle, the UK. Only 17.1% of South Asian migrant women were found to be performing 30 minute episodes of at least moderate activity on most days of the week,

compared to 36.5% of European women. When comparing the data obtained for men as mentioned in the above section, a higher prevalence of physical inactivity was also seen among South Asian women in Newcastle (Hayes et al., 2002).

For the study by Hayes et al. (2002), South Asian participants were sampled from the Family Health Services Authority register (FHSA) by identifying South Asian sounding names. The sample can be considered as fairly representing the South Asian population in Newcastle as the source was FHSA (Hayes et al., 2002). However, it can be argued that the use of South Asian sounding names may have affected the quality of sampling. Particularly, it can be confusing to identify the country of origin of participants with Islamic names. Using self-reported data to determine the level of physical activity may have also affected the accuracy of the findings to some degree as participants may over- or under-estimate their engagement in physical activity (Hayes et al., 2002).

Further exploring the issue, a systematic mixed-methods review to investigate the current levels of physical activity and sedentary time among South Asian migrant women was conducted by Babakus and Thompson (2012). The systematic review was mainly focused on studies conducted in Western countries such as UK, US and Australia (Babakus & Thompson, 2012). The quantitative component of the research suggested that South Asian migrant women living in developed countries do not perform the recommended level of physical activity for health benefits (Babakus & Thompson, 2012). Supporting the findings of Hayes et al. (2012), this research revealed that South Asian migrant females in the Western world had low levels of physical activity compared with their male counterparts, and also compared with white European comparison populations (Babakus & Thompson, 2012). Measured physical activity in Kcal/day (95% CI) for South Asian males in the UK was 2350 (2200-2490) and for

South Asian females in the UK was 1750 (1640-1870) (Babakus & Thompson, 2012). However, making valid comparisons between the levels of physical activity among different groups can be challenging due to lack of standardised physical activity measurement (Babakus & Thompson, 2012). This can be seen as a common challenge for research into physical activity.

The study conducted by Misra et al. (2005) showed a lower engagement in physical activity among Indian migrant women in Northern California, the US when compared with migrant Indian males. Daniel et al. (2013) conducted a study comparing leisure time, household and occupational physical activity in female and male Indian migrants in the US. It can be said that provision of definitions for the terms leisure time physical activity, household physical activity and occupational physical activity, which were seen as missing, would aid the reader to better grasp these concepts. Lack of clear definitions of the different terms related to physical activity and sedentary lifestyle can be seen as a common challenge faced by the researchers. Daniel et al. (2013) concluded that female participants performed less occupational physical activity than male participants. The results also revealed that women were engaged in more household physical activity than men, and in regard to leisure time physical activity, this was primarily light-intensity. In this study, participants were recruited primarily from religious institutions. Therefore, the study sample may have affected the representativeness of the South Asian Indian population in the US to some extent. In addition, how activity changes through the seasons was not known as data were collected primarily in the spring and summer months (Daniel et al., 2013).

Exploring the research conducted in the US, it is evident that these studies were mainly focused on the Indian migrant population and the issue of physical inactivity among

other South Asian ethnicities was inadequately explored. However, according to statistics from the United States' Census Bureau (2015), Indians being the largest South Asian population and one of the fastest growing ethnic groups in the US, the fact that most of the studies focused on them can be justified.

Sedentarism among South Asians: An overlooked issue

As discussed in the previous chapter, according to the contemporary view of sedentariness (any waking behaviour characterised by an energy expenditure equal to or less than 1.5 metabolic equivalents (METs) while in a sitting or reclining posture), physical inactivity does not explain the complexity of sedentarism and individuals can be physically active and yet sedentary (Biddle, 2004; Tremblay, 2012). In regard to sedentary lifestyle among South Asian migrants, Babakus and Thompson (2012) pointed out that sedentariness among these migrant populations in Western countries was overlooked. Of 26 quantitative studies, which were included in the review, only two studies researched sedentary time among migrant South Asians and these two studies reported higher sedentary times among South Asian migrants living in developed countries than other population groups (Babakus & Thompson, 2012). However, no studies have adequately dealt with the modern concepts of sedentariness when researching sedentary behaviour among South Asian migrants in the Western part of the world (Biddle et al., 2009).

2.2.2 New Zealand context

In New Zealand, there is minimal research conducted to investigate the level of physical activity and sedentary lifestyle among South Asian migrants. The research conducted by Kolt et al. (2007) is seen as the key study which explored this issue even though the research focused only on one South Asian ethnic group. This study investigated the

level of physical activity, body fatness and nutritional behaviours, and also the link between the duration of stay in New Zealand and the level of physical activity among South Asian Indian migrants in New Zealand. The findings regarding nutritional behaviours are not discussed in this thesis. Kolt et al. (2007) concluded that migrant South Asian Indians, particularly women, in New Zealand are more likely to be less physically active, and more overweight and obese than other Asian ethnic groups such as Central, East, South-East and Northern Asians. The study also concluded that there is an inverse link between the length of stay in New Zealand and the level of physical activity (Kolt et al., 2007). Supporting the findings of Kolt et al. (2007), National Health surveys conducted in the periods of 2002-2003, 2006-2007 and 2011-2013 also revealed low physical activity levels and high obesity levels among South Asians in New Zealand (Scragg & Maitra, 2005; Scragg, 2010; Scragg, 2016).

Level of physical activity and sedentariness

Kolt et al. (2007) researched the level of physical activity among 112 Indian participants selected using convenience sampling (Kolt et al., 2007). Low physical activity levels with large variability were found among the study sample (Kolt et al., 2007). Compared to female counterparts, males were significantly more active and showed a higher variability in daily pedometer steps (Kolt et al., 2007). Daily step count for the sample were low ($5,977 \pm 3,560$ steps/day) and considerably different between males ($6,982 \pm 4,426$) and females ($5,159 \pm 2,401$) (Kolt et al., 2007). According to recommendations for daily accumulated physical activity, 33% of the sample was classified as low active (5,000-7,500 steps/day) and a further 48% as sedentary ($< 5,000$ steps/day) (Kolt et al., 2007). It appears that, when examining sedentary time, the more conventional notion of being physically inactive was used. As in the studies conducted in other developed

countries, more contemporary concepts of sedentarism were not explored within the New Zealand context.

The results of National Health surveys conducted in the periods of 2002-2003, 2006-2007 and 2011-2013 support the findings of Kolt et al. (2007). The 2002-2003 survey concluded that South Asians in New Zealand are more likely to be less physically active, overweight and obese than other Asians (Scragg & Maitra, 2005). The 2006-2007 health survey showed that South Asians (46%) were less physically active compared with New Zealand Europeans (54%) (Scragg, 2010). In the survey, “physically active” was defined as doing at least 15 minutes of vigorous (aerobic) activity, or 30 minutes of moderate activity, on 5 of the previous 7 days (Scragg, 2010). Investigating the prevalence of physical activity in the last 7 days in the periods of 2011-2012 and 2012-2013, only 45% of adult female South Asians and 48% of adult South Asian males were physically active (Scragg, 2016). Rasanathan, Tse, et al. (2006) and DeSouza (2006) also point out that South Asians in New Zealand show poor engagement in physical activity and South Asian women are less likely to be physically active than other Asian women. A report by the ADHB (2006) outlines that South Asian Indians are less physically active (74%) compared to New Zealand Europeans and Pacific Islanders (89%).

The association between the length of settlement in New Zealand and levels of physical activity

Kolt et al. (2007) also explored the link between the length of stay in New Zealand and levels of physical activity among Indian migrants. Findings revealed that pedometer-measured physical activity levels decreased with a decrease in pedometer steps when individuals had lived in New Zealand for longer, even when adjusting for age and sex

effects (Kolt et al., 2007). However, a clear explanation for the relationship between low levels of physical activity and the duration of stay in New Zealand was not presented (Kolt et al., 2007). According to Triandis (2001), changes in ecology results in changes in culture which result in changes of personality and behaviours. This can be considered as a potential explanation to how migration to New Zealand affects the behaviours such as physical activity of Indian migrants.

In view of the discussed study findings, it is evident that South Asian migrants in Western countries including New Zealand are less physically active and are more sedentary than other ethnic groups. The findings also claim that female South Asian migrants have a lower level of physical activity than their male counterparts. Even though some potential limitations are identified in the studies conducted globally and in New Zealand, the totality of the evidence that South Asian migrants, particularly females, are less physically active than Europeans and other populations is compelling. The next section discusses how low levels of physical activity among South Asian migrants in Western countries are closely associated with high prevalence of lifestyle diseases among them.

2.3 The link between low physical activity levels and lifestyle diseases among South Asian migrants in developed countries

2.3.1 International context

Overview of the prevalence of lifestyle diseases among South Asian migrants

South Asians are more likely to develop chronic lifestyle illnesses like cardiovascular diseases and endocrine disorders such as type 2 diabetes and metabolic syndrome than Europeans (Daniel et al., 2013; Gujral et al., 2013; Parikh, Aurora, Dash, Shin & Palaniappan, 2015; Patel, Phillips-Caesar & Boutin-Foster, 2012). South Asian migrants

living in developed countries around the globe also show a similar trend (Daniel et al., 2013). According to Jepson et al. (2012), South Asian migrants in Scotland have a two-fold increased risk of heart disorders and a five-fold increased risk of type 2 diabetes when compared to the general population (Jepson et al., 2012). Jepson et al. (2012) also state that the risk of stroke in migrant South Asian is 1.5 fold greater compared with majority populations in Scotland. A study conducted by Fernandez, Everett, Rolley, Rajaratnam and Davidson (2015) to explore migratory implications for coronary heart disease risk prevention in Indian migrants in Australia also found that more Indian females were suffering from hypercholesterolaemia and hypertriglyceridaemia compared to Caucasian females, and migrant Indians had a higher incidence of hypertension when compared to other population groups.

Examining the risk profile for developing such chronic health conditions, South Asians' genetic predisposition to lifestyle diseases, unhealthy dietary patterns, tobacco use, harmful use of alcohol and their low physical activity levels have been identified as playing major roles (Public Health Agency of Canada, 2015; Daniel et al., 2013; Hine et al., 1995; Jepson et al., 2012; Kolt et al., 2007; Misra et al., 2005). Poor physical activity is seen as significantly affecting the likelihood of developing chronic lifestyle diseases (Daniel et al., 2013; Hine et al., 1995). This section discusses the association between the higher prevalence of few lifestyle diseases - cardiovascular illnesses, diabetes and metabolic syndrome - and the low levels of physical activity among South Asian migrants in developed countries.

Cardiovascular illnesses and low levels of physical activity

The Bristol Black and Ethnic Minority Health Survey conducted in the UK uncovered a link between higher prevalence of coronary heart diseases and lower levels of physical

activity among female South Asian migrants living in the UK, particularly Pakistani women (Hine et al., 1995). Supporting the study findings of Hine et al. (1995), the research conducted by Hayes et al. (2002) investigating the prevalence and risk factors associated with cardiovascular diseases among South Asian migrants in the UK identified less physical activity among this ethnic group as a major risk factor for developing these lifestyle diseases. An in-depth literature search using international databases also revealed similar findings (Garduño-Díaz & Khokhar, 2012). Further research investigating migratory implications for cardiovascular illnesses using a database search and integrative review methodology, showed four times higher age-adjusted mortality for chronic heart disease among Indian migrants in Australia compared to both the native Australians and migrants from other countries (Fernandez et al., 2015). The research also revealed that Indian migrants had the highest prevalence of overweight individuals, which is a risk factor for coronary heart disease, when compared to migrants from other countries. Fernandez et al. (2015) claimed that up to 71 % of migrant Indian men did not meet current guidelines for participation in physical activity. Strengthening the findings of Hine et al. (1995), this study concluded that low level of physical activity is linked to higher prevalence of chronic heart diseases among Indian migrants (Fernandez et al., 2015).

Diabetes and low engagement in physical activity

The Bristol Black and Ethnic Minority Health Survey identified physical inactivity as an important risk factor in developing non-insulin-dependent diabetes mellitus among South Asian migrants living in the UK (Hine et al., 1995). The relationship between diabetes and low physical activity levels among South Asian migrants was further investigated by Sriskantharajah and Kai (2007). An exploratory qualitative research was conducted to investigate attitudes towards and influences on physical activity among

female South Asian migrants with diabetes and coronary heart disease, living in the UK (Sriskantharajah & Kai, 2007). Sriskantharajah and Kai (2007) claimed that undertaking of physical activity to limit progression of their disease was largely unrecognised by female South Asians. Hence, low levels of physical activity contributes to worsening of the course of diabetes among migrant female South Asians.

Metabolic syndrome and low levels of physical activity

Exploring the effect of physical activity on other endocrine illnesses, the association of duration and intensity of leisure time physical activity to physiological indices of metabolic syndrome in Indian migrants residing in Northern California was researched quantitatively (Misra et al., 2005). This cross-sectional study by Misra et al. (2005) provided evidence that Indian migrants who are physically active have a more favourable metabolic syndrome risk factor profile. The study concluded that there is a strong relationship between low engagement in leisure time physical activity and high prevalence of metabolic syndrome in Indian immigrants (Misra et al., 2005).

2.3.2 Evidence from New Zealand

An overview of the burden of lifestyle diseases among South Asian migrants in New Zealand

South Asian populations in New Zealand are more likely to be victims of lifestyle illnesses than European populations (Rasanathan, Tse, et al., 2006). Examining the diabetes prevalence in the ADHB in 2013, it is seen that the numbers increase dramatically with age, reaching above 70% of the population for Pacific people, above 60% for South Asian Indians, 30% for Maoris and 20% for New Zealand European and other populations by the age of 60 (ADHB, 2015). This data highlights the fact that

even though the population size of South Asians is comparatively smaller, they are at high risk of developing lifestyle diseases.

The 2002-2003 National Health Survey also showed supporting evidence (Scragg & Maitra, 2005; Scragg, 2010). Higher rates of treated diabetes (14%) and hypercholesterolaemia (12%) were seen among South Asian migrants in New Zealand compared with other migrant Asian groups (Scragg & Maitra, 2005). A literature review by Ljiljana (2014) also points out that the prevalence of type 2 diabetes among South Asians from the Indian subcontinent living in New Zealand is higher than the prevalence of diabetes in their country of origin. Moreover, South Asians were more likely to be on antihypertensive drugs and cholesterol reducing agents than Europeans (Scragg, 2010). According to the MoH (2006), Indian females in New Zealand have higher mortality rates from ischemic heart disease than female Chinese New Zealanders.

Rasanathan, Tse, et al. (2006) also point out that if the Asians are considered as a whole, levels of lifestyle diseases such as diabetes and cardiovascular conditions do not seem especially high. However, South Asian migrants on their own as a sub group within the Asian group show the highest prevalence of self-reported diabetes than any other ethnic group in New Zealand (Rasanathan et al., 2006). Rasanathan, Tse, et al. (2006) also claim that South Asians who are residing in New Zealand for a long duration are generally less healthy than recent migrants across a range of indicators including mortality rates of cardiovascular diseases and prevalence of health promoting behaviours. According to Rasanathan, Tse, et al. (2006), this can be justified given that a sound health status is needed for most migrants to New Zealand to be granted permission to enter the country. It is also seen that most of the South Asian migrants have advanced levels of education and a high socioeconomic status in their countries of

origin which, correlate to their better health status on entering the country (Rasanathan, Tse, et al., 2006). Arguably, their socioeconomic status lowers when they migrate to New Zealand and with increased duration of stay in New Zealand, this positive effect on health abates (Rasanathan, Tse, et al., 2006).

Having recognised the higher burden of lifestyle illnesses among South Asians in New Zealand, the link between the higher prevalence of these lifestyle diseases and low engagement in physical activity among South Asians was researched.

The relationship between low levels of physical activity and higher rates of lifestyle diseases among South Asian migrants in New Zealand

The study conducted by Kolt et al. (2007) revealed that 74.4% of participants were classified as less physically active and were suffering from lifestyle illnesses, with the most prevalent being cardiovascular diseases and diabetes (Kolt et al., 2007). This indicates that there is a link between low physical activity levels and higher rates of chronic health conditions among South Asian Indian migrants in New Zealand.

The findings of Kolt et al. (2007) also show high levels of obesity, which is considered as a major risk factor in developing lifestyle diseases, among Indian participants. For the sample, the average percentage body fat was 41.1 ± 9.1 with women considerably higher than men. The average body mass index (BMI) for the sample was 27.2 ± 4.7 kg/m² with women (28.0 ± 5.4 kg/m²) having considerably higher BMIs than men (25.6 ± 5.4 kg/m²) (Kolt et al., 2007). Sixty nine percent of the sample was obese (BMI ≥ 25 kg/m²) and a further 13.7% were overweight (Kolt et al., 2007).

A study conducted by Rush, Freitas & Plank (2009) revealed that South Asian Indians have more central body fat than other populations which can be a risk factor for developing chronic lifestyle illnesses. Another study carried out by Rush et al. (2007) also showed that South Asian Indian women in New Zealand had the greatest central fat mass followed by Maori, New Zealand European, and Pacific women. The association between central adiposity, as measured by waist circumference, and physical activity was further investigated by Kolt et al. (2007). Higher pedometer step counts were associated with lower waist circumferences; however, the association was weak with large confidence intervals (Kolt et al., 2007). The comparatively small study sample can be seen as causing weak associations. The fact that the study is only focused on South Asian Indian migrants can be justified as Indians are the largest South Asian ethnic group in New Zealand (New Zealand Government, 2014). However, there is a need for more research to explore the issue of physical inactivity among South Asian migrants as a whole.

In view of the discussed findings, it is evident that South Asian migrants, particularly females, showed a lower engagement in physical activity than other ethnic groups. As there is a clear link between low levels of physical activity and higher prevalence of lifestyle diseases among South Asian migrants in developed countries around the globe including New Zealand, investigating the factors influencing physical activity and sedentary lifestyle among female migrant South Asians is of great importance.

2.4 Challenges and facilitators influencing physical activity and sedentary lifestyle among female South Asian migrants

A number of qualitative studies using thematic analysis have been conducted in Western countries to explore the barriers and enablers influencing physical activity and

sedentary lifestyle among South Asian migrant women. Sedentary lifestyle was not explored as a separate issue and it was seen as embedded in the issue of physical inactivity. In regard to the barriers to physical activity, a number of themes relating to South Asian culture, South Asian migrants' socioeconomic status and the environment have been identified. Further, it is evident that themes are often interwoven and may in fact have a cumulative effect. No research studies were found on challenges and facilitators influencing physical activity and sedentary lifestyle among South Asian migrants in New Zealand.

2.4.1 Barriers

The cultural identity of South Asian women as carers

A major cultural barrier identified is that, in South Asian culture, women are considered as the primary carers of their spouse, children and relatives in the family, and their centre of attention is meant to be the family (Babakus & Thompson, 2012; Hine et al., 1995; Sriskantharajah & Kai, 2007). The burden of domestic duties and family responsibilities often took over all other activities and left South Asian migrant women in developed countries with no or less time for physical activity (Caperchione, Chau, Walker, Mummery, & Jennings, 2015). Lawton, Ahmad, Hanna, Douglas & Hallowell (2006) also claimed that other barriers such as time constraints and less opportunities to engage in physical activity are interwoven with cultural expectations such as prioritisation of commitments to family members.

Fear of entering mixed-sex settings

Discomfort with exercising in public is another cultural factor that acts as an obstacle for South Asian migrant women in Western countries to engage in physical activity (Hine et al., 1995; Sriskantharajah & Kai, 2007). As a result, exercise sessions outside

the home do not reach many of these women (Hine et al., 1995). Sriskantharajah and Kai (2007) reported that, in the UK, many South Asian migrant women from all religions avoided participating in mixed-gender physical activities offered at sports centres, particularly swimming, due to their own or their families' concern about modesty. Lawton et al. (2006) stated that when South Asian Indian and Pakistani migrant women in the UK were willing to engage in physical activity, lack of culturally sensitive women-only facilities with female instructors often frustrated their efforts. The study findings showed that several female respondents reported how they had been not able to keep up with general practitioners' advice to go swimming and to undertake light gym work because of cultural taboos about exposing their bodies to male members (Lawton et al., 2006). Lawton et al. (2006) claim that even though the focus of the study was on Indian and Pakistani participants, the findings could be generalised to other South Asian ethnic groups.

Limits are placed on some South Asian immigrant women's daily activities due to overprotectiveness of family members, and this appears to compound the cultural pressure already faced by these women (Sriskantharajah & Kai, 2007). Adult family members place limitations on going out, especially, entering mixed-gender settings, which results in lack of socialisation into outdoor physical activities (Sriskantharajah & Kai, 2007; Lawton et al., 2006).

Lack of fluency in English

Limited knowledge of English was identified as a social barrier to physical activity among migrant women of South Asian origin in Western countries (Hine et al., 1995; Sriskantharajah & Kai, 2007). The study conducted by Sriskantharajah and Kai (2007) in the UK revealed that language difficulties significantly affected the participation in

more formal physical activity such as aerobic or yoga classes. Consequently, it discouraged South Asian migrant women who are not able to communicate in English effectively from attending such sessions (Sriskantharajah & Kai, 2007). Similarly, lack of fluency in English and therefore potentially encountering problems if assistance was necessary while out alone, was reported as another social constraint to physical activity (Lawton et al., 2006; Sriskantharajah & Kai, 2007). Poor communication skills due to language barriers can also be seen as interwoven with cultural concerns about females participating in outdoor physical activity (Lawton et al., 2006).

Lack of knowledge about physical activity

Poor self-assessed health, low level of awareness of the positive effects of physical activity including health benefits, and low level of knowledge about the appropriate amounts of physical activity were recognised as barriers for South Asian women in Western countries to engage in physical activity (Babakus & Thompson, 2012; Sriskantharajah & Kai, 2007). This issue is seen as closely related to a lack of specific guidance from health professionals regarding the necessary type and amount of physical activity (Babakus & Thompson, 2012; Sriskantharajah & Kai, 2007). In the study conducted by Sriskantharajah and Kai (2007), South Asian migrant women in the UK reported that the advice they had been offered in regard to physical activity by their health professionals was lacking specificity, in contrast to specific advice regarding nutrition received from dieticians. During consultations, health professionals generally urged the women “to just do more exercise” when they sought more specific guidance about the types and amounts of physical activity (Sriskantharajah & Kai, 2007). However, in this study, using an interpreter to obtain information from some participants may have affected the quality of data to some degree (Sriskantharajah & Kai, 2007). Researcher bias was also identified as an issue by the authors as the

researchers' health professional backgrounds may have influenced the way they interpreted the descriptive data (Sriskantharajah & Kai, 2007).

Lack of putting the knowledge into practice

An in-depth literature review conducted by Lucas, Murray and Kinra (2013) to explore the qualitative evidence of health beliefs related to lifestyle diseases among South Asians living in the UK revealed that South Asian migrant women exhibited low level of behavioural control in regard to their physical activity behaviour (Lucas et al., 2013). Even though some participants were aware of the importance of physical activity for health, preventing disease by adopting an active lifestyle was not a prioritised goal (Lucas et al., 2013).

Busy schedules and long working hours

Lack of time for exercise due to family and work commitments was also recognised as a social challenge to physical activity among South Asian migrants (Caperchione et al., 2015; Hine et al., 1995; Lawton et al., 2006). In the research conducted by Lawton et al. (2006) in the UK, many South Asian female migrant participants emphasised the difficulties of incorporating physical activity into what they regarded as extremely busy lives. It was uncovered that due to financial constraints, most South Asians in Western countries work very long and anti-social hours, often in shops and restaurants which makes allocating time for physical activity extremely difficult (Babakus & Thompson, 2012; Lawton et al., 2006).

Cold weather

The studies have identified cold weather in Western countries as an environmental barrier to physical activity among female South Asian migrants (Babakus & Thompson,

2012; Caperchione et al., 2015; Lawton et al., 2006). In the research conducted by Lawton et al. (2006), virtually all British female South Asian participants disfavoured going outside in wet and windy conditions. Moreover, extensive use of cars was reported in winter months, even for short trips (Lawton et al., 2006).

Unfamiliarity of neighbourhood

South Asian migrants' unfamiliarity of their neighbourhood was seen as limiting outdoor activities such as walking (Lawton et al., 2006). The feeling of vulnerability due to lack of familiarity with their neighbourhood can be compounded by language barriers as described above (Lawton et al., 2006). According to the findings revealed by Lawton et al. (2006), South Asian migrants in the UK reported a low level of awareness of their neighbourhoods and most women did not feel safe going out to exercise. Babakus and Thompson (2012) also identified fear for personal safety as a constraint to outdoor exercise.

2.4.2 Facilitators

External motivators

Studies have shown that the main motivators for engagement in physical activity among female migrant South Asians were external motivators (Babakus & Thompson, 2012; Jepson et al., 2012; Sriskantharajah & Kai, 2007). A qualitative research study conducted to uncover facilitators to physical activity among South Asian migrant women in Scotland showed that a commonly reported external motivator was undertaking physical activity as an opportunity for social activity and enjoyment (Jepson et al., 2012). This draws attention to the significance of promoting group-based physical activity through family and community networks (Jepson et al., 2012). In this study, researchers were somewhat restricted to ask specific questions as the project was

commissioned by the National Health Education and Promotion Agency, Scotland to answer particular questions (Jepson et al., 2012). This may have to some degree affected the extent of the facilitators and motivators they could explore (Jepson et al., 2012).

Reduction of body weight, and improving physical and mental wellbeing were also recognised as external motivators to physical activity among South Asian female migrants in Western countries (Babakus & Thompson, 2012; Jepson et al., 2012; Sriskantharajah & Kai, 2007). Role models were also identified as an inspiration and motivation for South Asian women to be involved in physical activities that they may otherwise lack confidence in (Babakus & Thompson, 2012; Jepson et al., 2012).

Sriskantharajah and Kai (2007) stated that, when discussing the facilitators and motivators to physical activity, the cultural significance of being physically active daily by engaging in household chores, rather than the “Western” concepts of organised physical activity such as going to gym or attending aerobic classes, was also emphasised by the South Asian females in the UK.

Internal motivators

For a lower percentage of women, the main facilitator to take part in physical activity was intrinsic motivation (Jepson et al., 2012). In terms of intrinsic motivators, the act of participating in physical activity is seen as driven by internal rewards such as the awareness of the positive outcomes of physical activity and the self-satisfaction of engaging in physical activity (Jepson et al., 2012).

2.4.3 A way forward suggested in the literature to overcome identified barriers and to strengthen the recognised enablers

Previous studies have identified some strategies to improve the level of physical activity among South Asian migrants by overcoming the recognised challenges. This section discusses these suggested measures as this information will be incorporated into the discussion of the study findings.

Exploring the recognised challenges to engagement in physical activity among female South Asian migrants in developed countries, it appears that culturally and gender-appropriate physical activity interventions have been recommended to improve the level of engagement in physical activity (Daniel et al., 2013; Hine et al., 1995).

However, Lawton et al. (2006) pointed out that while some South Asian migrant women in the UK would benefit from culturally sensitive strategies, such as female instructor-led, women-only swimming sessions, these measures may be unrealistic for other South Asian women due to competing demands on their time which can act as a barrier to participate in activities scheduled at fixed times. Hence, to ensure both practicality and cultural sensitivity of these strategies, it is essential that health promoters consider these practical difficulties and improvise culturally and gender-appropriate measures which capitalise on the kinds of activities South Asian migrant women in Western countries can do in their day-to-day lives, and activities which are flexible in regard to time and location (Daniel et al., 2013; Hine et al., 1995; Lawton et al., 2006). Group activities were also identified as a strong factor that aids to build confidence in women who are reluctant to partake in physical activity (Jepson et al., 2012). It is also evident that measures attempting to improve the level of physical activity in female migrant South Asians in developed countries need to consider the socioeconomic status of these women (Daniel et al., 2013). For instance, women with

lower socioeconomic status may not benefit from introducing physical activity programmes that are not free of cost.

It has been recommended that health promoters and healthcare practitioners need to offer more specific guidance to South Asian migrant women about the type, frequency and duration of physical activity (Babakus & Thompson, 2012; Lucas et al., 2013; Sriskantharajah & Kai, 2007). Moreover, educational information on physical activity can be disseminated among these women with the help of community leaders (Babakus & Thompson, 2012).

Having analysed the current knowledge of the issue of physical inactivity and sedentary lifestyle among South Asian migrants in Western countries, the next section identifies the knowledge deficit with regards to the New Zealand context of the issue.

2.5 Conclusion- Identified knowledge gap

South Asian migrants living in the Western world including New Zealand, are at high risk of developing health conditions such as cardiovascular diseases and type 2 diabetes. Kolt et al. (2007) argue that even though the South Asian population in New Zealand is on a steady rise, limited attention is drawn to them as a population group with a higher risk of developing lifestyle diseases. Furthermore, Kolt et al. (2007) claim that New Zealand health policies are mainly focused on Pacific Islanders and Maori as high risk populations for lifestyle illnesses. Rasanathan, Tse, et al. (2006) also support the viewpoint of Kolt et al. (2007), claiming that despite high prevalence of type 2 diabetes, Indians migrants are rarely prioritised as an at-risk group in current diabetes strategies. For instance, even though a number of studies including a few projects, based in South Auckland revealed higher prevalence of diabetes among Indian New Zealanders, the

“Let’s Beat Diabetes” strategy by Counties Manukau District Health Board failed to draw sufficient attention to the Indian population (Rasanathan, Tse, et al., 2006).

Rasanathan, Tse, et al. (2006) point out that there is a need for health policy advocates and policy makers in New Zealand to consider the specific necessities of South Asian migrants and to identify best practice approaches for interventions for at-risk South Asian migrants. Kolt et al. (2007) also support this argument, claiming that South Asian migrants in New Zealand, particularly women, require more support to become and remain healthy.

Poor engagement in physical activity among South Asian Indian migrants in New Zealand, particularly women, has been recognised as a key factor contributing to the burden of lifestyle diseases (Kolt et al., 2007). Even though low engagement of physical activity illuminates many of the challenges to physical activity encountered by South Asian migrant women, this public health issue was researched inadequately. The importance of further research in regard to the issue of sedentariness among South Asian migrants in New Zealand, particularly the contemporary view of the sedentarism, is also identified. Since the research conducted in New Zealand focused on Indian ethnicity, a need arises for researching the issue of physical activity and sedentariness among other South Asian ethnicities.

As very little is known about the challenges and facilitators influencing physical activity and sedentary lifestyle among female South Asian migrants in New Zealand, my research question - what are the challenges and facilitators influencing physical activity and sedentary lifestyle among South Asian migrant women in New Zealand? - is formulated to fill this identified knowledge deficit. Answers to the proposed research

question may be used to implement measures that would aid to improve the level of physical activity and to ultimately reduce the burden of preventable or modifiable lifestyle diseases among South Asian migrant women in New Zealand, enabling them to enjoy more healthy and productive lives in New Zealand.

CHAPTER THREE: RESEARCH METHODOLOGY AND METHODS

Research consists in seeing what everyone else has seen, but thinking what no one else has thought.

*-Albert Szent-Györgyi, in Irving Good, *The Scientist Speculates*, 1962*

3.1 Introduction

This chapter discusses and justifies the selection of the methodology, qualitative description, to conduct the study, outlining its philosophical and theoretical underpinnings. Second, the research methods which are used in sampling, participant recruitment, data collection and data analysis are discussed and their selection is justified. Furthermore, ethical and cultural considerations involved in this research project will be discussed. Finally, the attempts to ensure rigour of the process will be described.

3.2 Methodology

Crotty (1998) identifies research methodology as the strategy lying behind the choice and use of particular research methods. Selecting the appropriate methodology is a crucial step in a research study (Crotty, 1998; Grant & Giddings, 2002). The increasing popularity of qualitative tradition in health research has led to an increasing awareness of qualitative methodologies (Sbaraini, Carter, Evans & Blinkhorn, 2011). The main goal of qualitative methodology is to gain an understanding of a particular phenomenon through immersion in the data (Liamputtong, 2009). Qualitative research is considered as naturalistic in its approach as the focal point of all qualitative approaches is to develop concepts to understand social phenomena in real world settings (Denzin & Lincoln, 2003; Grbich, 2003; Mays & Pope, 1995). Hence, in this study, qualitative methodology is chosen to uncover participants' challenges and facilitators to physical activity and sedentary lifestyle.

As a result of the proliferation and increasing complexity of qualitative research in the healthcare field, some researchers are pressured to claim qualitative methodologies which they are not strictly following such as phenomenology, grounded theory or ethnography (Sandelowski, 2000; Sullivan-Bolyai, Bova & Harper, 2005). Sandelowski (2000) outlines qualitative description as “a distinctive method that researchers can claim unashamedly without resorting to methodological acrobatics” (p. 335).

Qualitative descriptive methodology is selected to conduct this research due to its distinct philosophical and theoretical roots, and methodological characteristics that enable exploration of the human experiences with respect to my topic.

Examining the philosophical roots of qualitative description, it is recognised as a distinct methodology of naturalistic inquiry that offers a comprehensive summary of events in everyday language (Sandelowski, 2000; Sullivan-Bolyai et al., 2005). In naturalistic inquiry, research will take place in a natural environment and data will unfold naturally, as the researcher will not interfere with the process by attempting to manipulate the data to fit his or her theory (Lincoln & Guba, 1985; Patton, 2002).

In view of paradigms, which Kuhn (1996) defines as “universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners” (p. x), it is evident that qualitative description lies within the post-positivist paradigm (Grant & Giddings, 2002). Post-positivism attempts to explore in-depth a phenomenon from the participants’ experiences (Crossan, 2003; Grant & Giddings, 2002). With the paradigm shift in the late 1960s, post-positivist views gained popularity as logical positivism was challenged by the ideas of people like Thomas Kuhn and Karl Popper (Kuhn, 1996; Grant & Giddings, 2002). Objectivism is the epistemology, the theory of knowledge, embedded in both positivism and post-

positivism. However, in contrast to positivism which strongly emphasises objectivity, post-positivism argues that there are multiple and competing views of science as well as multiple truths; hence, complete objectivity is impossible (Crotty, 1998; Grant & Giddings, 2002; Guba & Lincoln, 1994). Within post-positivism, researchers were not considered to be value-free as previously claimed by positivists, but were affected by their social, cultural and political context (Grant & Giddings, 2002). Therefore, the post-positivist paradigm underpins qualitative description as the preferred methodology for this research.

In regard to the theoretical perspective of qualitative description, it is founded in existing knowledge and pre-understandings and takes a pragmatic approach without drawing on explicit theories (Sandelowski, 2000; Neergaard, Olesen, Andersen & Sondergaard, 2009). As my research aims to answer the research question by uncovering participants' challenges and facilitators to physical activity and sedentary lifestyle in real world setting without complete objectivity, the philosophical roots and theoretical underpinnings of qualitative description frame it as the preferable methodology to conduct the study.

In terms of methodological characteristics, qualitative descriptive study is the method of choice when straight descriptions of phenomena are desired (Sandelowski, 2000).

Qualitative descriptive researchers stay close to the data and produce findings closer to the data (Neergaard, et al., 2009; Sandelowski, 2000). As this research aims to generate a straightforward description and comprehensive summary of the challenges and facilitators to physical activity and sedentary lifestyle among South Asian migrant women in New Zealand, the selection of qualitative description as the methodology to conduct this study can be justified. Another reason why qualitative description is chosen

for this study is that, qualitative descriptive studies seek to understand complex events, processes and experiences that are embedded within human context, and the ultimate goal of this methodology is a rich description of participants' experiences events or processes unfolded in an easily understandable language (Sandelowski, 2010; Sullivan-Bolyai et al., 2005). Moreover, the findings of qualitative descriptive studies have enormous potential to translate directly to pressing healthcare situations, and to provide information about ways to tackle issues (Sullivan-Bolyai et al., 2005). In addition, qualitative descriptive studies can be used to assess, develop and refine interventions within vulnerable ethnic minorities in an attempt to eliminate health disparities, making it the suitable methodology to explore issues among South Asian minority women in New Zealand (Sullivan-Bolyai et al., 2005).

3.3 Methods

3.3.1 Sampling

Maintaining consistency with qualitative description, participants were selected using purposive sampling. The aim of purposive sampling is to include participants who are able to give a detailed description of their challenges and facilitators to physical activity and sedentary lifestyle (Sutton, Hocking & Smythe, 2012). A group of eight South Asian migrant women aged 18-65 were recruited through snowball method.

Inclusion criteria were that they should be currently residing in Auckland, have resided in New Zealand for longer than a year and be able to clearly communicate with the researcher in English. Participants who were suffering from neurocognitive impairment and from any major medical or surgical conditions, which are considered absolute contraindications to physical activity, were excluded.

Attempting to include maximum possible variation, women were selected from three South Asian countries: two Pakistanis, two Indians and four Sri Lankans. Maximum variation facilitates qualitative descriptive researchers to investigate the common and unique manifestations of a target phenomenon across a broad range of phenomenally or demographically varied cases (Palys, 2008; Sandelowski, 2000). Moreover, it offers a broad insight into a topic of interest (Neergaard et al., 2009).

The number of participants was limited to eight. A small sample size of less than 10 is generally considered sufficient to achieve a rich understanding of the topic (Dworkin, 2012; Marshall, 1996). Women who are currently residing in Auckland were recruited as the highest concentration of South Asians is found in Auckland (New Zealand Government, 2014). Extreme age groups were avoided to minimise vulnerability of the participants.

3.3.2 Recruitment

The recruitment of respondents was done using snowball sampling by distributing a poster advertising the research study (refer Appendix B) among South Asian migrant women through the researcher's personal contacts. Snowball sampling method is used frequently to conduct qualitative research, primarily through interviews and this technique of "chain referral" was used in this study as some degree of trust was required to initiate contact with participants (Atkinson & Flint, 2001). Initially, potential participants were contacted by emailing them an information sheet containing all the relevant information about the study process (refer Appendix C). Upon participants' expression of interest in participating in the research, a consent form was sent to them (refer Appendix D). Along with the signed consent form, participants' additional

contact details were obtained by the researcher, and the arrangements were made to conduct the interviews.

3.3.3 Data collection

Semi-structured face-to-face interviews were conducted to collect data. To obtain rich descriptions of the topic of interest, this type of interview was seen as the preferable data collection method as it allows partial pre-planning of the questions, giving the freedom to the researcher to tailor questions to the interview context (Whiting, 2008). Semi-structured interviews also allow informants the freedom to express their views in their own terms, providing reliable and comparable qualitative data (Mathers, Fox & Hun, 1998; Whiting, 2008).

Face-to-face interviews are characterised by synchronous communication in time and place, and the answers of interviewees are more spontaneous without an extended reflection (Opdenakker, 2006). Moreover, social cues such as voice, intonation and body language of the respondents aided to shape the interview questions and the flow of the interviews (Opdenakker, 2006). Shaped by these characteristics, face-to-face interviews were used in this qualitative descriptive study to gain more insight into the interviewees' challenges and facilitators to physical activity and sedentary lifestyle.

Interviews were scheduled at the participants' houses and at a designated time at their own convenience. Prior to commencing the interviews, participants' characteristics such as demographic data (refer Appendix E) and information about their current level of physical activity were collected. A questionnaire, which developed using the International Physical Activity Questionnaire (IPAQ) as a guide, was used to obtain information about participants' current level of physical activity (IPAQ Group, 2002)

(refer Appendix F). According to the answers on the questionnaire about their physical activity in a usual week, the level of physical activity of the participants is categorised into insufficiently active, minimally active and HEPA active as follows (IPAQ Group, 2004). HEPA active category includes health-enhancing physical activity (IPAQ Group, 2004).

- Category 1- Insufficiently active:- the lowest level of physical activity. Those individuals who do not meet criteria for categories two or three are considered ‘insufficiently active’
- Category 2- Minimally active:- the minimum pattern of activity, if any one of the following three criteria:
 - a) Three or more days of vigorous activity of at least 20 minutes per day or,
 - b) Five or more days of moderate-intensity activity or walking of at least 30 minutes per day or five or more days of any combination of walking, moderate-intensity or,
 - c) Vigorous intensity activities achieving a minimum of at least 600 metabolic equivalent of task (MET)-min/week.
- Category 3- HEPA active. A more active level, if any of the following two criteria:
 - a) Vigorous- intensity activity on at least three days achieving a minimum of at least 1500 MET-minutes/week or,
 - b) Seven or more days of any combination of walking, moderate-intensity or,
 - c) Vigorous intensity activities achieving a minimum of at least 3000 MET-minutes/week

During the interviews, the issue of physical activity and sedentary lifestyle was explored to obtain rich descriptions using the below mentioned set of predetermined questions.

- What was the main reason for you and your family to migrate to New Zealand?
- Are there any challenges as a South Asian migrant settling in New Zealand?
- Did these challenges, if any, affect your level of physical activity?
- What does physical activity mean for you?
- What does sedentary lifestyle mean for you?
- Are you aware of being physically inactive and sedentary, and being physically active and yet sedentary?
- Are you aware of the benefits of physical activity?
- Are you aware of the negative effects of not being physically active?
- Are you aware of the risks of sedentary lifestyle?
- Are you using public parks, beaches and fitness centers?
If so, how often/how many times a week, for how long a day?
If no, are you aware of these amenities in your area?
- Do you think your level of physical activity increased/decreased or stayed the same after you migrated to New Zealand?
- Do you believe your current level of physical activity is sufficient?
- Do your partner and children engage in physical activities?
If yes, what is their current level of engagement in physical activity?
If no, why do you think they don't engage in physical activity?
- Are you facing any challenges to physical activity and sedentary lifestyle?
- If so, what are they?
- Do you have any positive influences to engage in physical activity?
- If so, what are they?

Information about participants' reasons for migrating to New Zealand and the hardships they underwent while settling in this new country was also obtained as these challenges can be interrelated with barriers to physical activity. Subsequent questions emerged from the interviewee's responses (Mathers, Fox & Hun, 1998). The process of interviewing was based on three principle phases: building rapport, apprehension and exploration (Whiting, 2008).

In the first two phases, the researcher engaged in general conversation before the interview to induce a more relaxed atmosphere and to alleviate any potential discomfort that the interviewees may feel, which facilitated moving onto exploration of the topic smoothly (Whiting, 2008). The median length of the interviews was 30 minutes. All the interviews were digitally recorded and some hand-written notes were also made by the researcher during the interviews to aid the transcribing process.

3.3.4 Data analysis

Digitally recorded interviews were transcribed verbatim. The transcripts were checked against the recorded interview several times for accuracy (Braun & Clarke, 2012).

Transcripts were then sent to participants to be checked for originality. All the participants agreed that the transcripts reflect their descriptions about the topic.

Transcribed data were analysed using thematic analysis, a flexible and increasingly popular method for analysing qualitative data (Braun & Clarke, 2012). Thematic analysis systematically identifies, organises, and offers insight into patterns of meaning across a set of data, allowing the researcher to understand and make sense of collective meanings and experiences (Braun & Clarke, 2012). As a novice researcher, qualitative data analysis was at first seen as an overly complex task. However, a visual and text-

based thematic map aided to identify the main themes, subthemes, and interconnections between themes and subthemes (Braun & Clarke, 2012).

Braun & Clarke (2012) describe two ways of conducting thematic analysis: inductive and theoretical. Inductive analysis is data-driven as it involves a process of data coding without attempting to fit it into a pre-existing coding frame (Braun & Clarke, 2006). On the contrary, theoretical analysis tend to be driven by the researcher's theoretical or analytical interest in the area of research. Hence, it provides a more a detailed analysis of some aspects of the data, rather than giving a rich description of the data overall (Braun & Clarke, 2006). A clear rationale of where the researcher stands in relation to these possible options of thematic analysis is essential to carry out a successful analysis (Braun & Clarke, 2012; Braun & Clarke, 2006). An inductive approach was taken to the data analysis of this study as the analysis was data driven. However, the interview questions were shaped by the themes appearing from the literature review. Therefore, it can be said that elements of theoretical analysis were not abandoned completely as researchers cannot totally free themselves of their theoretical and epistemological commitments (Braun & Clarke, 2006). As explained by Braun & Clarke (2012), the thematic analysis was conducted using six phases.

The first phase was to become acquainted with the data (Braun & Clarke, 2012). The aim of this phase is to become familiar with the content of the data set and to begin to notice things that might be relevant to the research question (Braun & Clarke, 2012). To identify the commonalities across the data set, it was necessary to listen to the digitally recorded interviews a few times and to read and re-read the transcripts "as data". Braun & Clarke (2012) point out that, reading data "*as data*" is to read the words analytically and critically, and to think about the meaning of the data. Making notes while listening

and reading was also an integral part of this step (Braun & Clarke, 2012). Braun & Clarke (2012) claim this step as a trigger for the next stage of the process, coding.

Step two began with the systematic analysis of the data through coding (Braun & Clarke, 2012). Codes are considered the building blocks of analysis (Braun & Clarke, 2012). Coding was done in large or small chunks (Braun & Clarke, 2012). Every time something that was potentially relevant to the research question was identified, it was coded as it is easier to discard codes than going back to the entire data set and recode the data (Braun & Clarke, 2012). The coding was done on hard-copy data, clearly identifying the code name, and highlighting the portion of the associated text (Braun & Clarke, 2012). Some portions of data were coded with more than one code. As coding progressed, the existing codes were modified to incorporate new material (Braun & Clarke, 2012). This stage ended when all the data were coded and were ready to be searched for themes.

In the third stage, the analytic process started to take shape as I shifted from codes to themes. Braun and Clarke (2006) state that a theme represents some level of patterned response within the data set. This phase involved reviewing the coded data to identify areas of similarity and overlap between codes, exploring the relationship between themes and considering how themes will work together in telling an overall story about the data (Braun & Clarke, 2012).

The fourth phase which was reviewing potential themes, was essentially about quality checking (Braun & Clarke, 2012). At first, a distinctive set of themes that work in relation to the coded data were identified (Braun & Clarke, 2012). Then, the entire data set was re-read to determine whether the extracted themes meaningfully captured the

entire data set (Braun & Clarke, 2012). Revision at this stage involved creating additional themes and discarding some of the existing themes.

In the fifth stage, themes were defined and named considering what is unique and specific about each theme (Braun & Clarke, 2012). Braun and Clarke (2012) point out that each theme identified should have a clear focus and a purpose. Each theme was developed in its own right, and also in relation to the research question and in relation to the other themes. Another important step in this phase was to name the themes. Braun and Clarke (2012) state that even though naming might seem trivial, it can provide valuable signals. Hence, attempts have been made to ensure the names are informative, concise and catchy. The fifth phase of thematic analysis involved the critical shaping up of analysis into fine details (Braun & Clarke (2012).

The final phase was to produce the report in order to answer the research question by providing a rich description of the data based on thematic analysis (Braun & Clarke (2012). Braun and Clarke (2012) state that writing and analysis are interwoven in qualitative descriptive studies and writing does not begin at the end of the analytic process. In this study, writing was a continuous process from the informal writing of notes to the more formal process of report writing.

3.4 Ethical considerations

Ethical and cultural considerations are essential elements in any successful research (Health Research Council of New Zealand, 2016). As the researcher forms a closer relationship with the participants, qualitative research may generate specific ethical and cultural issues (Holloway & Wheeler, 1995). Application of ethical principles are essential to ensure prevention or reduction of harm to the participants. Ethical approval

for this study was obtained from the Auckland University of Technology Ethics Committee (AUTEC) (Refer Appendix A).

Informed and voluntary consent was obtained from the participants and is considered a key ethical element. (Holloway & Wheeler, 1995). The process of informed consent is set firmly within the principle of respect for autonomy (Holloway & Wheeler, 1995).

By sending an information sheet, potential participants were informed about the objective of the research, authority of approval, the contact person to obtain information about the study, the entire process of the research including inclusion and exclusion criteria for selection, the topic to be explored and the potential risks and benefits in simple and clear language appropriate to the potential participants. It was necessary that participants had an understanding of the potential risks to safeguard the rights of the participants (Doody & Noonan, 2016).

Upon expressing interest to participate in the study, voluntary consent was obtained by signing a consent form. Particular attention was given to explaining the interview process. Participants were informed that interviews would be digitally recorded and they could request to cease the recording if they feel uncomfortable at any stage during the interviewing (Wheat, 2009). Participants were also informed that they would be updated about any new developments throughout the course of the study (Fowler, 1988). In addition, participants were assured that they may withdraw themselves from the study at any stage until the completion of data collection (Fowler, 1988).

Fidelity involves the researcher maintaining confidentiality and anonymity of the participants (Doody & Noonan, 2016). It facilitates maintaining a trusting relationship between the researcher and the participants (Doody & Noonan, 2016). It also ensures

that the participants' right to privacy is respected by the researcher (AUTEC, 2015a; Holloway & Wheeler, 1995). Doody and Noonan (2016) state that the researcher is obliged to safeguard the participants as they place trust in the researcher. In order to protect the identity of the research participants in this study, an identification number was allocated to each participant to ensure that identifiable information was successfully secured and that identifying information was not entered into a potentially accessible database (Polit and Beck, 2004). As this study used a small sample, there is the potential for participants to be identified. Therefore, when transcribing, data analysing and writing up findings, any identifying details such as individual expressions or language nuances were excluded, and only the information in fitting with the findings were included (Holloway & Wheeler, 1995; Doody & Noonan, 2016).

Furthermore, to maintain confidentiality, the participants were assured that their identity will not be revealed in future articles or reports presented for publications, and that the information would only be used for the purpose for which it was gathered (AUTEC, 2015a; Holloway & Wheeler, 1995; Doody & Noonan, 2016). Participants were also informed that they had a right to access all personal information held by the researcher (AUTEC, 2015a; Doody & Noonan, 2016).

The safekeeping of the data and other confidential documents was also taken into consideration (AUTEC, 2015a). The electronic data were kept securely in the researcher's personal computer, which is password protected. The signed consent forms were stored in a locked cupboard to which only the researcher and the supervisors had access. The digital recordings of the interviews were permanently deleted after the transcription is completed. As agreed with the supervisors, the signed consent forms and

the interview transcripts will be stored for a period of six years and then will be destroyed.

Vulnerability is a prominent ethical consideration that required consideration. It was anticipated that, as a minority ethnic group, participants may feel distressed when they describe challenges they encountered in the process of settling in to New Zealand. Moreover, it was expected that they may feel uncomfortable when talking about poor exercise patterns and barriers obstructing their involvement in physical activity as migrant women (Holloway & Wheeler, 1995; Wilkie, 1997). All the participants were treated with dignity and respect to minimise possible vulnerability of minority participants due to their migrant status (Holloway & Wheeler, 1995; Wheat, 2009). Being a female South Asian migrant myself, my rich understanding and familiarity of the issue of vulnerability facilitated taking the necessary practicable steps to minimise the risk of emotional harm to the participants (Holloway & Wheeler, 1995; Wheat, 2009).

The principle of justice is another important aspect of ethics (Doody & Noonan, 2016). Throughout this research study, participants were treated fairly and equitably. Doody and Noonan (2016) point out that within the principle of justice, the researcher is obliged to distribute benefits and risks equally, without prejudice. In this study, justice was also applied when providing the opportunity for potential participants to partake in research, and also when ensuring anonymity and privacy of the participants (Doody & Noonan, 2016). Justice will also be practised by distributing the benefits of the research to the whole South Asian community (Townsend, Cox & Li, 2010). Once the thesis is completed, the results will be disseminated to the participants, relevant community centres and organisations.

3.5 Cultural factors

Cultural appropriateness of this research was ensured by consulting the committee members of the Sri Lankan Buddhist temple with respect to three vital Te Ara Tika principles: protection, participation and partnership (AUTEC, 2015b; Hudson, Milne, Reynolds, Russell & Smith, n.d.). Maori cultural issues in terms of rights, roles and responsibilities of the researcher were identified and applied to the South Asian minority ethnic group (Hudson et al., n.d.). Key cultural aspects such as protecting South Asian cultural values and beliefs and maintaining a harmonious relationship with the participants were highlighted during the consultation. How this research can contribute to providing useful and relevant outcomes to the South Asian migrant community was also discussed. This consultation has shaped the cultural appropriateness of the interview structure, questions and interview technique. It has also provided an in-depth understanding of the respect for vulnerability of South Asian female migrants.

3.6 Ensuring rigour

The concept of rigour refers to the quality of the research process (Liamputtong, 2009). Often, the trustworthiness of qualitative research is judged against positivist criteria such as internal and external validity, objectivity and reliability (Lincoln & Guba, 1985). Polit and Beck (2004) state that the qualitative approach is based on the view that reality is socially constructed and it can be interpreted but cannot be measured. Hence, it is not reasonable to test the trustworthiness of qualitative data using objective tools. Lincoln and Guba (1985) introduced credibility, dependability, confirmability and transferability as qualitative equivalents for the conventional quantitative criteria to test trustworthiness of qualitative research. These criteria were used to maintain the rigour throughout the process (Lincoln & Guba, 1985).

Credibility refers to conducting the study in a way that enhances the believability of the findings (Liamputtong, 2009; Polit & Beck, 2004). As described by Lincoln and Guba (1985), credibility of this study was achieved using prolonged engagement, persistent observation and member checking.

The strategy of prolonged engagement was practised by investing sufficient time before the interviews to have an understanding of the culture, language and views of the participants (Polit & Beck, 2004). Polit and Beck (2004) state that prolonged engagement allows the building of trust and rapport with respondents which ultimately results in obtaining accurate and rich data.

Credibility of data collection was maintained by the strategy of persistent observation. Persistent observation was carried out by focusing on aspects relevant to the topic of interest such as participants' body language or characteristics of conversations during the time of pre-interview and interview (Lincoln & Guba, 1985; Polit & Beck, 2004). These aspects assisted to shape the flow of the interview.

Member checking was done by taking the interview transcripts back to the participants to obtain their reactions (Polit & Beck, 2004; Sanders, 2006). This "member checking" strategy checks if the researcher's descriptive results reflect the participants' descriptions and the meaning the descriptions held for them (Munhall, 1994; Mays & Pope, 2000). All the participants agreed with how their interviews were transcribed, and no one wanted to add, remove or alter the content.

Dependability indicates that the research findings are consistent and could be repeated (Liamputtong, 2009; Lincoln & Guba, 1985). Dependability was ensured by

maintaining a well-documented and traceable research process (Finlay & Ballinger, 2006). An audit trail - a systemic collection of materials such as audiotapes and transcripts of the interviews, notes that were taken during the interviews, formulated meanings and composed themes - was securely maintained (Liamputtong, 2009). How the work and thinking progressed through the research process was demonstrated with the use of a research diary (Finlay & Ballinger, 2006).

Confirmability refers to the extent to which the findings of the study are shaped by the informants, and not by researcher bias, motivation, or interest (Lincoln & Guba, 1985). A pre-understanding interview was conducted prior to data collection where the researcher was interviewed by a peer researcher to become aware of the researcher's beliefs, values and personal biases regarding the topic of interest (Sutton, et al., 2012; Giddings & Grant, 2009). The pre-conceived knowledge of the researcher about the topic, particularly as a health professional, cannot be completely abandoned. However, this process of self-reflexivity assisted to minimise applying the researcher's pre-determined categories of meanings to approach each participant's account with an open mind as to the possible meanings (Sutton et al., 2012; van Manen, 1990).

Frequent consultations with the supervisors also aided to enhance reflexivity (Sutton et al., 2012). At each stage - initial preparation, recruitment of participants, interviewing, transcribing, data analysing, writing-up the thesis - supervisors were consulted. The process was examined by them and the progress was discussed. Upon going through the transcripts and identifying the themes, these themes were discussed with the supervisors and the relevancy of the themes to the research question was confirmed.

Transferability of the study is the extent to which the findings can be transferred to other settings or groups (Liamputtong, 2009). According to Lincoln and Guba (1985),

qualitative researchers are responsible for providing sufficient descriptive data in the research report so that the audience can evaluate the applicability of the data to other contexts. The possibility for transferability of this study was enhanced through the use of purposeful sampling and also by obtaining rich descriptions from the participants (Sutton et al., 2012).

3.7 Summary

This chapter introduced qualitative description as the preferable methodology to conduct the research to uncover challenges and facilitators influencing physical activity and sedentary lifestyle among South Asian migrants in New Zealand. This research aimed to obtain a rich description of the topic of interest, therefore, the selection of qualitative description as the methodology is justified. Furthermore, the chapter discussed how philosophical and theoretical roots of qualitative description frame it as the methodology of choice to conduct the study.

The chapter also looked into the research methods used. The recruitment process included informing participants about the entire research process by sending an information sheet and obtaining voluntary consent from those who expressed willingness to participate in the study. Using snowball method and purposive sampling, eight South Asian women of age 18-65 who are currently residing in Auckland were recruited. Data was collected by conducting semi-structured, face-to-face interviews. During the interview, demographic data of the participants, information about their current level of physical activity, and rich descriptions of challenges and facilitators to physical activity and sedentary lifestyle were collected. Their challenges of settling in New Zealand as migrants were also explored. Interviews were digitally recorded and transcribed verbatim by the researcher.

Thematic analysis was used to analyse the data as described by Braun and Clarke (2006). Ethical and cultural aspects are considered an integral part of research. Ethical approval for this study was obtained by the AUTECH. Application of the ethical issues such as obtaining informed and voluntary consent, maintaining confidentiality, respect for vulnerability and the principle of justice are described. Cultural appropriateness of the study is ensured by consulting the committee members of the Sri Lankan Buddhist temple. Key cultural issues like protecting South Asian cultural values and beliefs were discussed during this consultation. Finally, this chapter examined the trustworthiness of the study using four criteria as described by Lincoln and Guba (1985): credibility, confirmability, dependability and transferability. The next chapter presents the findings, the end product of thematically analysed data, of this study.

CHAPTER FOUR: FINDINGS

If it weren't for the fact that the TV set and the refrigerator are so far apart, some of us wouldn't get any exercise at all.

-Joey Adams, in M. P. Singh, *Quote Unquote: A handbook of quotations*, 2007

4.1 Introduction

In this chapter, the participants' current level of physical activity according to the International Physical Activity Questionnaire and their understanding of physical activity and sedentary behavior are outlined (IPAQ, 2004). Following this, themes extracted in regard to challenges influencing physical activity and sedentary behavior among South Asian migrant women are reported. In the second half of the chapter, themes relating to facilitators influencing physical activity and sedentary lifestyle among female migrants of South Asian origin are also presented.

The process of data analysis of this study was approached inductively. The themes emerged from the thematic analysis were data driven without attempting to fit the data into a pre-existing coding frame (Braun & Clarke, 2006). However, elements of theoretical analysis were not entirely abandoned as the interview questions were shaped by the themes that emerged from the literature review.

As mentioned in the previous chapter, face-to-face interviews were guided by a set of semi-structured questions to gather rich information about the challenges and facilitators influencing physical activity and sedentary lifestyle among South Asian migrant women in New Zealand. Additional questions were posed according to participants' responses. The first interview was commenced with questions about physical activity and sedentary lifestyle. However, after discussing with the primary

supervisor, it was understood that exploring background information about participants' migrant history and challenges they encountered in settling in to New Zealand may set the scene well for the topic of physical activity and sedentary lifestyle, including challenges and facilitators. Therefore, the order of the questions were amended for subsequent interviews.

4.2 Participant characteristics including the current level of physical activity

The participant characteristics were based on the demographic data obtained from respondents. Data were collected regarding age, ethnicity, religion, history of suffering from lifestyle illnesses, BMI, marital status, number of children and their ages, level of education, current occupation and the current level of physical activity of the respondents.

To determine the level of physical activity, information about participants' daily activities in a usual week was collected using a questionnaire. The questionnaire was formed using the IPAQ as a guide (IPAQ, 2002). The level of physical activity was determined according to the IPAQ guidelines as described in the previous chapter (IPAQ, 2004). Of eight participants, two are minimally active and the remaining six participants are insufficiently active. Table 3 summarizes the participant characteristics.

Table 3

Participant Characteristics

No.	Age	Ethnicity	Religion	If suffering from Type 2 DM/ hypertension (HTN)	BMI	Marital status/ Number of children	Age of the children	Level of education	Current occupation	Current level of physical activity as per IPAQ
1	50	Indian	Buddhism	No	22.7	Married 2 children	22,18	Master's degree	Counsellor	Minimally active
2	54	Pakistani	Islam	No	26.4	Married 3 children	26,25,19	Bachelor's degree	Healthcare coordinator	Minimally active
3	35	Pakistani	Islam	No	29.9	Married 3 children	8,6,2	Bachelor's degree	Housewife	Insufficiently active
4	38	Indian	Hindu	No	31.6	Married 1 child	8	Bachelors Degree	Healthcare coordinator	Insufficiently active
5	63	Sri Lankan	Buddhism	Borderline cholesterol	29.1	Married 3 children	32,34,29	Bachelor's degree	Healthcare coordinator	Insufficiently active
6	41	Sri Lankan	Hindu	Pre HTN	36.6	Married 2 children	12,8	Bachelor's degree	Lab technician	Insufficiently active
7	34	Sri Lankan	Buddhism	No	19.5	Married 1 child	2	Master's degree	Psycho-Therapist	Insufficiently active
8	34	Sri Lankan	Catholic	No	19.9	Married No children		Bachelor's degree	Medical doctor	Insufficiently active

4.3 Physical activity and sedentary lifestyle from participants' perspective

The researcher did not introduce the standard definitions of the terms “physical activity” and “sedentary lifestyle” to the participants. Instead, their understanding of these terms was sought. Most participants recognised physical activity as any form of activity that makes their muscles move or make them burn out:

For me, physical activity means something to keep you active, in shape. Any kind of activity walking, jogging, household work.

It is not only going to gym, your day to day activities, you see, any activity that make you burn out.

... moving around, simple walk, gardening. Any activity makes you sweat out.

However, in terms of the preferable type of physical activity, some participants opted for more organised exercise such as gym sessions and other organised sporting activities. One participant considered organised physical activity such as gym workouts with an instructor as more productive as instructor-led sessions motivate her more to keep physically active than other unorganised activities:

If I join then I know I will be compelled to go. When you see other people exercise, it motivates you. If you have an instructor then you have a target plan. When I walk, sometimes I feel lazy.

Similarly, two other participants stated that physical activity included any sort of activity. However, they preferred gym sessions than other activities like walking and one considered using a gym is a more effective means of reducing body weight:

Physical activity can be household work, exercising and even yourself - activities you enjoy, all of them. But, unfortunately, I am not fond of walks. I enjoy going to gym few times a week.

Physical activity is some exercise, walking, treadmill, jogging, any activity....
Me and my friends want to go to gym because if we walk we don't lose weight. I went for walks but I didn't lose weight.

Another participant gave a detailed account of how she understands the term “physical activity” and she opted for activities like walking rather than organised exercises like gym sessions:

In my view, it is some movements like walking. Even when sitting, you can move your legs and arms. Physical activity is where your muscles move, any kind of activity makes your muscle move. For me, exercise doesn't mean only going to a gym. Previously I was at home. Cleaning, dish washing take lot of your energy. So any kind of activity come under physical activity, not that you have to go to gym and spend one hour. Sometimes I do yoga at home. I think walking is better. When go to gym, you are mentally stressed. You think you have to go, otherwise the money you are spending is wasting. When walking, I can freely walk for whatever time I feel like.

One woman identified physical activity as more organised activity:

I would say, some sort of activity more than just the household work.

In regard to sedentary lifestyle, most participants did not have a clear understanding of sedentarism. Few had a general understanding of sedentary lifestyle and they identified the term as equal to physical inactivity. For one participant, sedentary lifestyle is:

Sitting and not moving any part of your body.

Another participant identified sedentariness as:

Not doing any sort of activity.

The modern concept of ‘being physically active but yet sedentary’ was not understood by all participants.

4.4 Themes in regard to challenges influencing physical activity and sedentary

Lifestyle

Figure 3 shows the themes that emerged from the data regarding the challenges influencing physical activity and sedentary behaviour among South Asian migrant women in New Zealand.

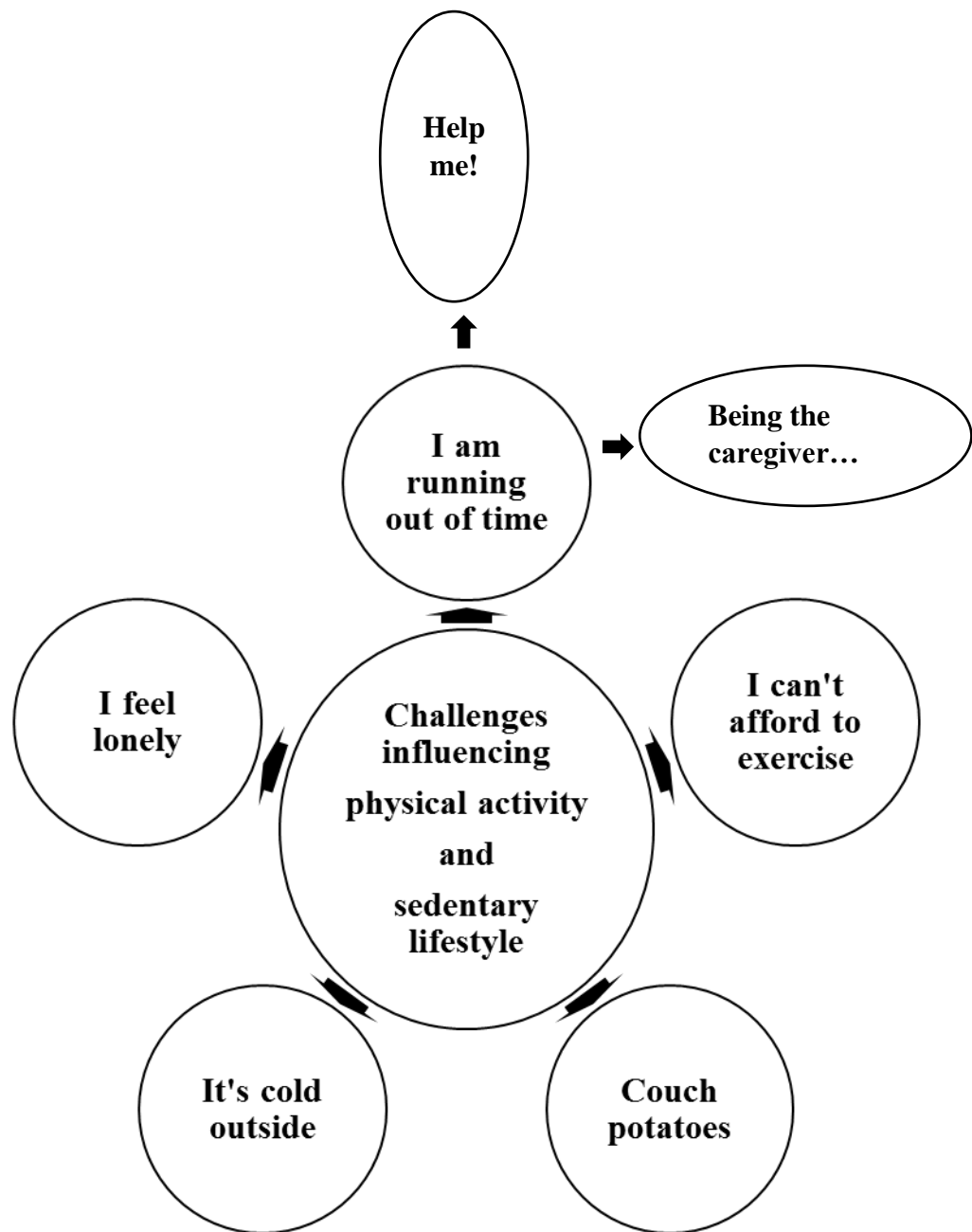


Figure 3. Challenges influencing physical activity and sedentary lifestyle

Analysing the information obtained from participants, five main themes related to challenges influencing physical activity and sedentary lifestyle among South Asian

migrants in New Zealand emerged and are named as: I am running out of time (time constraints), I can't afford to exercise (financial difficulties), couch potatoes (sedentarism), it's cold outside (unfavourable weather) and I feel lonely (isolation). Within the theme - I am running out of time - two sub themes were identified: being the caregiver... (family commitments) and help me! (lack of support). The individual themes were often seen as interconnected with each other. Two miscellaneous themes of cultural barriers, and religious and spiritual priorities were also created from the data that were hard to categorise.

4.4.1 I am running out of time (time constraints)

Time constraints were seen as influencing participants' engagement in physical activity, and also they were also seen to be facilitating sedentary lifestyle. All respondents stated that lack of time for physical activity stemmed from family commitments and, to a lesser extent, from work responsibilities and other commitments such as preparing for professional licensing exams. Lack of social support was also identified as closely related with time constraints.

Being the caregiver... (family commitments)

All the women identified themselves as the main caregivers in the family and they related this identity to their South Asian culture. They reported that they had more domestic responsibilities than their husbands and the combination of home and work commitments left them with little time for engaging in physical activity. One of the participants mentioned that sparing time for physical activity was not prioritised by her and her South Indian female family members:

Time management is sometimes a challenge. Now I started working, so not like before I am very occupied with job, house work, my kid's work, my studies and all. Hmm, sometimes I am too busy dealing with my kid's and my husband's work. My health comes second. It is how we South Indians. Even women in my family does the same. Family comes first.

Others also mentioned about having to prioritise household work and taking care of family over physical activity. They stated that it was very difficult to find time to take care of their health:

Managing time is an issue - job, house work, children's work. I feel when I come home after work, I have to spend time with family rather than exercising. So not having much time for my physical activity is an issue. In weekends, I have house chores. Also other family matters are prioritised over spending time for physical activity for my health.

When I was home, in my school days, I used to play netball, basketball, badminton. I was enjoying school activities. After coming here, after I got married, everything changed. Now I don't have lot of time to look after me... had to take a job to settle down. Had to go to work, come home, prepare for next day and repeat the same schedule. So no time for physical activity. Looking after the kids is sometimes too much, at every stage, they have new problems. I go to work, come home, watch TV, cook, prepare for next day and go to sleep. Until kids go to bed we are busy...

One participant shared her experience of how challenging it was to spare time for physical activity when she was a new migrant as she had to prioritise her family and work:

I had to manage household work, business, children's affairs while trying to settle in a new country. My priority was children's education. I couldn't spare time especially for exercises.... children were small. My priority was children's education. I couldn't spare time especially for exercises.

Another participant held the viewpoint that the issue lies not only within the South Asian culture of identifying women as caregivers, but also within South Asian women themselves as they are lacking ability to find the right balance between family and work commitments:

I work part-time, but I also involve in our family business. There is no doubt managing work and finding time to exercise is challenging, but I do manage to find time for both. I can go to gym with no pressure after coming from work. But sometimes I do feel pressured, if I don't cook I don't think it is good to go to gym. Giving first place to family is our culture but I don't say our culture is bad, it is sometimes our mistake that we can't balance all.

Some participants who are health professionals could not spare time for physical activity as they had to allocate much time preparing for examinations which they had to go through in order to obtain their professional licence to work in New Zealand.

A few women voiced this issue as below:

... for me, mainly it was time management issues, I am a medical officer by career, it was a long procedure. I couldn't just go and do the exam. I had to prepare. So I spent most of my time studying, I had to spare time for my studies. Physical activity was not a priority. I was concentrating on medical council's requirement to get license to practise here. My level of physical activity went down as for months and months I was sitting and studying.

I am kind of stressed... lot of studies to clear all the registration exams and all... no time to exercise.

Working long hours also was identified by some participants as posing challenges to find time for physical activity. A few responses regarding this issue are quoted below:

We have to work hard and long to survive here in Auckland. So, cannot exercise enough.

Managing time is an issue. When I come home after long work, I am tired. I feel like sitting and resting when I get some free time. Not wanting to exercise

I used to be more physically active before coming here. Now with work-extra shifts, and all I can't do it.... time management is a problem for me. Have to manage work, household stuff and all.

Help me! (lack of support)

All the participants stated that lack of social support poses challenges to spare time for physical activity. Most of them reported that in their home countries, they lived with other family members and they received enough support with childcare and household work. As migrants in New Zealand, most of the participants only have nuclear families and they do not get sufficient assistance from the family with household chores and taking care of children, leaving them with little or no time for physical activity.

One participant indicated that verbal encouragement for physical activity from their spouse was not adequate, and household labour division is necessary to be able to spare time for physical activity:

He (husband) says you need to exercise to lose weight, you are putting on weight, you need to look beautiful but don't really support with my work.

Several other participants' descriptions of this issue are best quoted below:

We don't have family support here. Me and my husband only. Here I have to take care of all my kids. My husband goes to work. In my country, we stay with my grandparents, uncles, aunties. Lot of support and we walk to their houses very often. Here we are alone. I can't find time to exercise.

We have to manage things primarily by ourselves, because here we don't have enough social support. So, no time for physical activity.

Back home, it is mostly extended family, we had support. We had totally different culture, we had a family to support. Here we don't have. At home, we had a maid to come and do all the house stuff, cleaning and all. But here we have to do everything by ourselves. No support here.

When my husband goes out, I can't go to exercise. Someone has to be with kids. Children under 14 can't be home by themselves here, so it is a big problem for us. Somebody, adult, has to be with them.

Another factor related to lack of social support is the inability of South Asian migrants to afford a nanny or domestic helper in New Zealand. As one participant stated:

In my country it is very easy to get a nanny, it is cheap. But here it is very expensive.

4.4.2 I can't afford to exercise (financial difficulties)

From the data obtained from the participants, it is seen that financial constraints pose challenges to engaging in physical activity in different ways: high gym fees, inability to own or rent medium or large sized houses, inability to hire a nanny or domestic helper due to high prices, and difficulty in finding employment appropriate to their educational background.

One woman mentioned about not being able to join a gym due to high rates:

High fees in gyms also barrier to migrants like us, even if we manage time. Gyms here are very costly. I inquired from 2, 3 places hoping to join. Joining fee is too much. Also, during working hours prices are less, I think from 8 am to 3 or 4 pm. In hours when all are home, it is expensive. Rates are over my budget.

Other participants also mentioned similar issues:

... there are couple of gyms around my home, but all are costly. So we haven't been able to use them.

... also, it (gym) is very expensive. You have to sign a 3 or 6-months contract to join a gym. And we have to pay on the spot.

Some women expressed concerns that they would feel guilty if they miss using a gym due to other commitments after paying a considerable amount upfront as a joining fee:

Even lots of gyms here, but because of the expenses we can't join. Also, if we pay and join and then don't go it is just a waste, you know.

Two participants held similar viewpoints about joining a gym with high rates:

When go to gym, you are mentally stressed. You think you have to go, otherwise the money you are spending is wasting.

... tried to join a gym, but gym is somehow expensive. So I thought why should I pay and exercise when I can walk for free.

Due to high prices, most of the participants are not being able to afford spacious accommodation. Participants stated that, compared to their home countries, the level of household physical activity in New Zealand is minimal as most of the participants stay in small houses with small or no gardens.

One participant mentioned how living in a small house has affected her level of physical activity:

Expenses are too much. Rents are very high compared to other parts of the world. As we are new here, we still have a small place. At home, we used to live in big compound. There no need to dress up and go out for a walk, we could walk in the compound.

Because house is small here, only little work to do, even vacuuming carpets only take few min. Washing clothes also is done with the machine. So not much activity.

Two other participants also commented on this issue, comparing their level of physical activity in their home countries and in New Zealand:

.. normally houses in my country are big, not like here. Kitchen is very far from the living area. We walk a lot. Houses are two storey, we climb stairs up and down a lot. Here everything is very small. Houses are small. No big garden. Only little walking and little house work. In my country, people think house work is enough. All girls do house work, after marriage, wife doesn't want to work. So they say for housewife cleaning and all are enough.

In my country, I had a two storey house, of course, we had to go up and down around 20 times a day. Here house is small. Not much walking or activity... Also, there were many people to take care of. Lot of household work at home. When I was at home, so much walking, getting around the place.

Another woman commented on the constraints not having a spacious house:

My husband wants to buy a treadmill but our house is small and it would take lot of space. So I was postponing it until we can afford to rent a bigger place.

As mentioned in the section 4.4.2, not being able to hire a nanny or domestic helper was also identified by the participants as a challenge to engage in physical activity:

In my country, it is very easy to get a nanny, it is cheap. But here it is very expensive...

In New Zealand, financial constraints due to difficulty in finding employment relevant to educational qualifications and previous work experience is another issue which is recognised by the participants as affecting their engagement in physical activity.

Particularly for health professionals, finding employment in their field has been cumbersome due to licensing requirements of professional bodies. As some women mentioned, having long South Asian sounding names, which European New Zealanders may find difficult to read is also seen as posing challenges in getting employment:

We have long names. When we put our name on an application for job, people find it difficult to read and they overlook our applications. Lot of my country women say it happened even at job interviews...

Due to financial demands, participants were compelled to find employment with low wages, which are not relevant to their educational qualification and past work experience, and also to work long hours. Working long hours with low wages makes it difficult for them to spend money on joining a gym or on hiring a domestic helper, consequently leaving them with little or no time for physical activity. It can also affect women's emotional health, making them feel like not wanting to engage in activities like exercise. The below mentioned quotes reveal the issue in participants' words:

I tried to get a job, to get a job in my profession, medical doctor, is not easy. I couldn't get a job in my field so I tried for other jobs. Pay is not good and I have to travel far and work long shifts. Of course, it affected my physical activity, I have no time for that and I was feeling down and had no mood to exercise.

Too many, regarding myself, I have to take exams and many procedures for a doctor to settle. There are many hardships, but I am trying to complete all the requirements... as I cannot work as a doctor, I had to take a job at a far place in South Auckland. Commuting is too much. It is a 8.5 hr job. I don't have time to go for a walk. Normally, my exercises are mainly walking. Because I had to take this job I can't walk on daily basis.

4.4.3 I feel lonely (isolation)

Most of the participants shared the feeling of isolation after migrating to New Zealand.

In their home countries they lived in extended families. Having extended family nearby, the women had social and peer support and encouragement to engage in physical activity, especially group activities. Several women stated that having a friend to exercise with would inspire them to become more physically active. They indicated that being accountable to someone to join for exercise may motivate them to engage in more physical activity.

One participant elaborated how isolation affected her engagement in physical activity, particularly during the initial days of migrating to New Zealand:

... it was very challenging. At home, I used to stay with many people, in a big family. After coming here, we are a nuclear family, me and my husband. My husband is going to work. I was all alone at home. First I was in Tauranga, quite lonely place. So, not having people around was challenging. Neighbourhood I don't know anyone. I know only my house owner. All go to work. I used to stand on the road to find someone to talk to. It was difficult. If someone is there to accompany me I would go out for a walk... if someone is there like friends, I can walk more. When we talk and walk we won't feel time is passing. When walking with my kid it is not easy. I have to think about her.

Another participant mentioned the lack of sense of community among South Asian women in Auckland, particularly in terms of social activities. She indicated that low access to community physical activity programmes due to poor social networking is a barrier to physical activity:

I think we Indians, Sri Lankans and Pakistanis are more spread-out. We don't have that sense of

Community. When it comes to things like physical activity. You can see other Asians, even women at 50s, 60s, they do things together, taking buses together. South Asian women only get together for religious things, things like going to temples and not for other social things.

4.4.4 It's cold outside (unfavourable weather)

Cold weather in winter was identified by all the participants as a deterrent to engage in physical activity, particularly outdoor activities. Especially coming from South Asian countries with a hot climate throughout most of the year, the women consider the winter season in New Zealand to be a challenge to engagement in physical activity.

One participant stated how cold weather influenced her level of physical activity:

....weather in New Zealand was another thing. As I came in December, weather was fine for 2, 3 months. But then it was bad. I couldn't stand the cold. I am from South India, it is very hot there. Because of cold, here we don't feel like going out to exercise. When it is cold and rainy, we don't go. I have to think about my daughter's health.

Other participants had similar views about the effect of cold weather on their engagement in physical activity:

Especially, the weather, in winter, in cold weather we don't feel like going out for a walk, that's the laziest thing I can imagine.

...as sun sets early in winter, if you want to go out for walk, you have to properly dressed. Also, you have to find a proper walkway. So, it is not easy to walk in the winter time.

One woman mentioned that she sought alternatives to outdoor physical activity during winter months:

New Zealand's atmosphere is good, but winter is a challenge. That is why I joined a gym. You don't feel like going for a walk in cold.

Other than not feeling motivated to engage in outdoor physical activity during the winter season, some participants also expressed concerns about safety when going out to exercise in winter evenings:

Weather here also is a challenge, when it is cold or windy, rainy it disturbs your routine. Then you won't feel like continuing again. It is getting dark early in winter, so when I come home after work, I am worried to go out for a walk. I have seen intoxicated individuals on the road.

4.4.5 Couch potatoes (sedentarism)

Being a “couch potato” or leading a sedentary life is identified as a challenge to physical activity. There are several aspects to this issue: lack of clear understanding of sedentariness, lack of motivation and commitment, laziness, work place sedentariness and frequent use of cars and less walking to places.

As stated earlier in this chapter quoting participants’ responses, only a few participants were aware of the term “sedentary lifestyle’. Those who were aware of it had the understanding that sedentary lifestyle merely means physical inactivity. None of the women had a clear understanding about the modern concept of “being physically active and yet sedentary”. This can be seen as facilitating sedentary lifestyle and challenging the engagement of sufficient overall physical activity and movement among the participants.

Frequent use of cars and less walking or using public transport were also identified as facilitating sedentariness and posing challenges to physical activity:

.....here we are using cars more. We drive for almost any work.

Many participants viewed the public transport system in New Zealand as not very efficient and therefore, they prefer driving rather than catching a bus or train. A participant stated that:

Obviously here it is more vehicle dependent. At first, I didn’t know to drive. Now I drive. Before, I used to take the bus but here bus is not easy to take. In my country it is easy to catch a bus anywhere. But, we have to walk to the bus stand. So I used to walk more there. Here in New Zealand you have to go city every time to take a bus. Less walking to get to a stop but you have to take two buses most of the time to go to places.

Two participants compared the modes of transport in their home country and New Zealand:

At home, people use more buses, bicycles and they walk. In here, we have to drive to save time. Taking buses takes time.

... in New Zealand, people drive to places more than in my country. I think it is because, if you use bus, most of the times, you have to take 2,3 buses. So it is costly and time consuming.

Lack of motivation, willingness and commitment, and laziness were also identified as contributing to sedentarism and low levels of physical activity:

Sometimes, I feel I am lazy to do physical activity as well, and I have no motivation...

... sometimes me being lazy to exercise....

One of the participants stated that she doesn't view physical activity as a pleasant task:

I get tired, therefore I feel lazy to do physical activities. So exercising is not a pleasant experience for me. It is I think your decision, if you want it in your life there is a way. Someone like me, it is just that not wanting to spare time for exercise.

Unfamiliarity of neighbourhood and concerns about the safety made some participants sit home and become "couch potatoes". One participant elaborated on this issue:

Sometimes it is scary to go out. When I came to New Zealand, I was not familiar with the neighbourhood. It is a new place. You don't know what sort of neighbourhood is around. I did not want to take any risk, you know. When it is a new place you can't go out much. So I used to stay home, sitting and sleeping. Also the place we stayed, even if I wanted to go for a walk, I was worried. We stayed in South of Mount Roskill, there were some incidents I heard. So I didn't want to take any risk.

Some workplaces are also seen as facilitating sedentary behaviour and posing challenges to physical activity. Two participants mentioned how computer-based office jobs are contributing to sedentariness:

Here in New Zealand mostly jobs involve lot of sitting in front of computers. So, less physical activity.

Now my job is mostly sitting with a computer. Very stressful, very demanding. So you won't have any ability to do physical activity when you are mentally stressed. First 3 years, I was on the field. We had to go and visit the clients. I was active. Now I wouldn't say I am like before. I am sitting mostly at work. Office-based job is a real limitation to physical activity.

4.4.6 Miscellaneous themes

Regarding challenges influencing physical activity and sedentary lifestyle, two miscellaneous themes were created from data, which were difficult to categorise.

Cultural barriers

One participant identified the cultural inappropriateness for Islamic women to use mixed-gender exercise facilities as a challenge to physical activity:

... me and my friends when we meet we always say we want to join a gym where only ladies go. But there are only 2 places, far from my house. There are gyms near my home but I can't go, these are mixed gyms, not only for ladies. Only my husband goes. It is our Islam culture.

Religious and Spiritual priorities

Prioritising religious and spiritual needs over physical activity is seen as inhibiting the engagement in physical activity. One participant stated:

I used to go to gym in the early morning. Now my lifestyle is different. I am meditating in the morning. So I stopped going to gym. I rather do my meditation in the morning than going to the gym. Meditation gives me mental satisfaction. Meditation is for my spiritual development. So I will sacrifice my physical well-being for my mental salvation. It is for religion.

4.5 Facilitators to physical activity

Figure 4 outlines the facilitators influencing physical activity and sedentary lifestyle among South Asian migrant women in New Zealand.

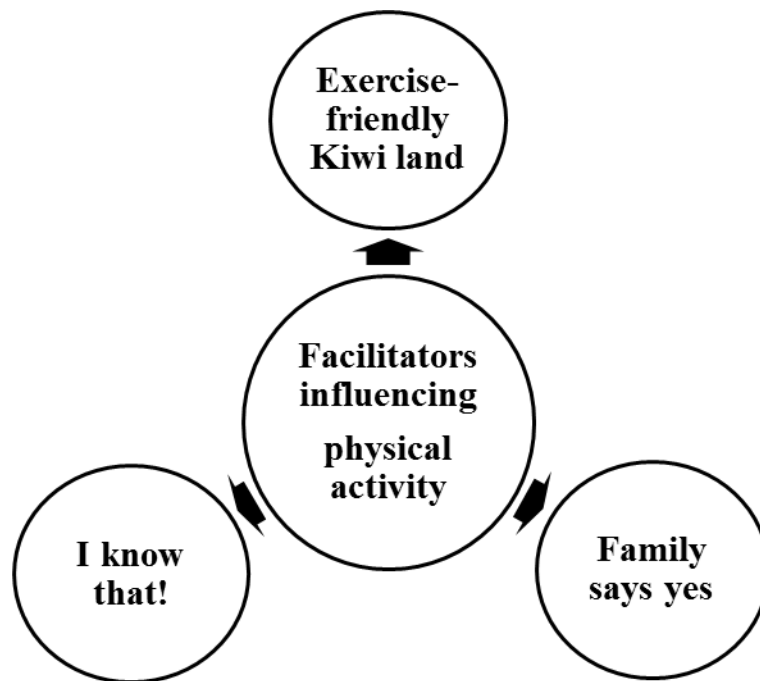


Figure 4. Facilitators influencing physical activity and sedentary lifestyle

Three major themes emerged from the participants' descriptions and these are named as: I know that! (knowledge), family says yes (family encouragement) and exercise-friendly Kiwi land (more opportunities).

4.5.1 I know that! (knowledge)

All the participants were well aware of the benefits of physical activity and the negative consequences of not being physically active. Knowledge about physical activity and its benefits is identified as an enabler to physical activity. The women mentioned physical, mental and emotional benefits of physical activity and also the negative outcomes of not being physically active. All the women emphasised lifestyle diseases that can develop as a result of not being physically active. Knowledge about the association between physical activity and diseases can be seen as linked to their health professional background. However, even the participants who are not in the health profession were

well aware of the fact that low physical activity can be a risk factor for developing lifestyle illnesses such as type 2 diabetes, hypertension and other cardiovascular diseases:

...when you are active, you are free of many diseases. Not gaining weight helps with diabetes, hypertension. General well-being. Your hormone levels stay normal. As I mentioned, more chances of getting high cholesterol, heart diseases, diabetes and all.

Physical activity affects the control of high blood pressure, diabetes, dyslipidaemia, osteoarthritis and other joint problems.

Several women expressed concern about the importance of being physically active to maintain health when they age:

When we grow old, our metabolism is lowering. What we eat is stuck into your body unless we exercise and burn out. If we don't do physical activity, we can't maintain our BMI (body mass index). Also you know high blood pressure, diabetes all sort of stuff comes when you don't exercise. Mainly, we don't want to get sick when we grow old.

Especially when you are aging your tendency to get diabetes, high cholesterol is more. When lack of physical activity it is not a very good thing. Working your muscles is important for good health.

As you grow old it can affect your health. You need to mobile your joints. Weight will also become an issue. Also, I would say to protect from diseases like diabetes. I have a family history of diabetes.

The impact of physical activity on mental and emotional health was also recognised as an enabler to physical activity. Several women highlighted weight reduction, healthy body image and improving mood:

When you are at home whole time, you get depressed. Physical activity makes you happy, you remain in good mood, good shape.

You also feel much better, mentally. Physical activity always has a mental component. It helps to maintain the shape of the body when our size goes higher, we don't have many options with what we can wear, you know yeah.

Physical activity also is a good hobby, good vibe. Otherwise you get ill, your body image goes bad, negative psychological influence.

Physical activity was also identified by the participants as a means of relieving stress and anxiety, and thus alleviating depression:

Be healthy, feel good, less worrying, less anxious, all these things. If you do activity you feel good. If I sit most of the time I feel depressed, feel sleepy and stressed. If I go out I feel nice.

... a lot, my personal experience, I feel activity really helps with my mental health, it is just very relaxing. I do suggest this to my clients also as exercise helps with depression, anxiety.

All the respondents had a good understanding of their level of engagement in physical activity. The women stated that they are aware their current level of physical activity is low and more engagement in physical activity is needed. Most women rated their level of physical activity as 0, 1 or 2 on a scale of 1 to 10 as quoted below:

...completely down, 0 to 1 out of 10, I would say.

I don't think I am exercising enough. Very low, 1-2 out of 10. I know, I should do more,

Participants' own understanding of their current level of physical activity is seen as correlated to the level of physical activity obtained using the IPAQ as a guide. The data showed more than half of the participants are insufficiently active. All the participants stated that their level of physical activity has decreased after migrating to New Zealand. Few responses are quoted below:

Now I am doing much less exercise than what I was doing before came to New Zealand.

After settling here (New Zealand), my activity level has gone down.

I used to walk a lot when I was home, but now, very little exercise

4.5.2 Family says yes (*family encouragement*)

All the participants stated that they receive encouragement from the family to engage in physical activity. This motivational support came mainly from participants' spouses and adult children.

My family supports me, they are really encouraging me to exercise, it is just that I don't find time.

My family is supportive. My husband wants me to start some physical activity.

My younger daughter is a gym freak. We all are members of a gym. My daughter motivates me to go to gym.

One of the participants stated that her husband verbally encourages her to be more physically active. She viewed his motivational support as a facilitating factor to engage in physical activity; however, she expressed concerns that mere verbal support is not sufficient and support with caregiving responsibilities is needed so she can have extra time for physical activity:

He (husband) says you need to exercise to lose weight, you are putting on weight, you need to look beautiful but don't really support with my work.

4.5.3 Exercise-friendly Kiwi land (more opportunities)

All the respondents viewed New Zealand as an exercise-friendly country. When compared with their home countries, they stated that New Zealand offers a lot more opportunities and facilities to engage in physical activity. Many women had places to exercise such as parks, and walking and cycling tracks in their neighbourhoods. Some of the participants' views about opportunities in New Zealand to engage in physical activity are quoted below:

New Zealand offers a lot more than in my country. It is just to find the way of getting there with all other commitments.

... plenty of places to exercise in my neighbourhood. Pools, walking tracts, gyms, a big park

... there is a park in Pakuranga, park next to church I am attending. I have seen so many cycle tracks, numerous pools and gyms in New Zealand, so here obviously is more conducive to exercise. In my country, to get to a decent gym or a walkway, you need to get to a main city. Not many parks or public places to walk or exercise.

New Zealand offers lot of opportunities, if you want to take it or not.

4.6 Summary

This chapter presented the themes emerged from the participants' responses relating to barriers and facilitators influencing physical activity and sedentary lifestyle among South Asian migrant women in New Zealand. Looking at the themes, more challenges than facilitators to physical activity were seen.

Time constraints, cold weather, lack of social networks, financial difficulties and lack of clear understanding of sedentariness (particularly about the modern concept of 'being physically active yet sedentary') and other factors facilitating sedentary behaviour were the main themes that emerged in regard to challenges influencing physical activity and sedentary lifestyle. Within the issue of time constraints, two other sub-issues were recognised: caregiving responsibilities and lack of family and social support. Two miscellaneous themes, cultural barriers and religious and spiritual priorities, also emerged. Regarding facilitators to physical activity, awareness of the positive effects of physical activity, encouragement from family and more opportunities to exercise are the major themes that appeared from the data. The individual themes are often seen as interrelated.

The next chapter discusses the study findings that are presented in this chapter.

Recommendations to overcome identified barriers and to strengthen the identified facilitators influencing physical activity and sedentary lifestyle will also be outlined.

CHAPTER 5: DISCUSSION AND RECOMMENDATION

Physical fitness can neither be achieved by wishful thinking nor outright purchase.

-Joseph Pilates, in C. Murakami, Morning Pilates Workouts, 2007

5.1 Introduction

The study findings show that South Asian migrant women in New Zealand are encountering a number of challenges influencing physical activity and sedentary lifestyle. The themes in regard to barriers to physical activity are related to time constraints due to caregiver responsibilities and lack of social and family support, unfavourable weather conditions, financial difficulties, isolation, and lack of clear understanding of sedentary life style and other factors causing sedentary behaviour. Two miscellaneous themes were also identified: cultural barriers, and religious and spiritual priorities. In terms of facilitators to physical activity, few enablers were recognised: awareness of the positive outcomes of physical activity, family encouragement and more availability of the facilities to engage in physical activity in New Zealand.

Some challenges and facilitators that emerged from the data are consistent with past literature such as time constraints, unfavourable weather conditions and lack of social support. This study also highlights barriers and enablers that had not emerged strongly as themes in the previous literature. For instance, lack of clear understanding of sedentary behaviour, particularly the modern view of sedentarism, and lack of sense of community (barriers), and knowledge of health benefits of physical activity and family encouragement (enablers). The identified themes are often interconnected and most of the identified barriers are modifiable. They are seen as reflecting wider determinants of health and health inequalities among minority populations, highlighting a link between

social determinants of health and challenges to physical activity. The results also indicate that health literacy as a sole strategy will not be effective in enhancing the level of physical activity.

This chapter concludes the thesis by providing an in-depth discussion of the study findings that answer the research question, and suggesting cultural and gender-appropriate recommendations to overcome the recognised barriers influencing physical activity and sedentary lifestyle, and to enhance the identified facilitators to physical activity. The benefits of the study findings to the public health arena are also elaborated on, keeping the limitations of this research in mind.

5.2 Challenges to physical activity and their link with wider determinants of health: “The causes of the causes”

The MoH (2004) identifies ethnic identity as a dimension of health inequalities among different ethnic groups in New Zealand, especially among minorities. The causes of these health inequalities are rooted in broad structural and contextual factors, as well as in individual and interpersonal factors (Ball, Carver, Downing, Jackson & O’Rourke, 2015). The main factor contributing to health inequalities is the unequal dissemination of social determinants between population groups (WHO, 2015a; Marmot et al., 2010). According to the WHO (2015b), social determinants of health are the conditions in which people are born, live, grow, work and age, including the health systems. Physical environment, income level, social status, social support networks, education, gender, culture and ethnicity are some of the key social determinants of health (WHO, 2015c). Marmot (2005) outlines that social determinants are also based on factors such as food, transport, stress and the social gradient. These wider determinants, which are seen as causing a number of barriers, which are identified as causing low level of physical

activity, explain the notion of “the causes of the causes” of public health issues outlined by Marmot et al. (2010). Figure 5 outlines the different levels of the model of social determinants of health from individual factors to wider socioeconomic, cultural and environmental conditions.

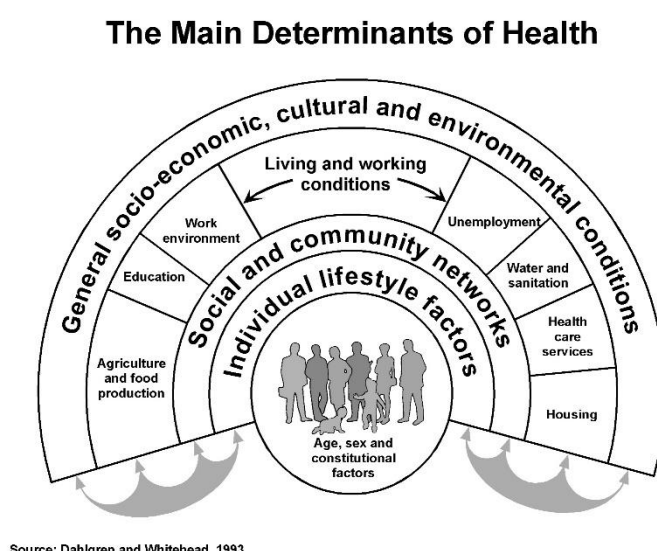


Figure 5. The main determinants of health. Reproduced from “tackling inequalities in health: what can we learn from what has been tried? Working paper prepared for the King’s Fund International Seminar on Tackling Inequalities in Health,” by G. Dahlgren and M. Whitehead, 1993, as cited in “European strategies for tackling social inequities in health: Levelling up Part 2”, G. Dahlgren and M. Whitehead, 2007, retrieved from http://www.euro.who.int/_data/assets/pdf_file/0018/103824/E89384.pdf. Copyright 1993 by the King’s Fund, London. Reproduced with permission.

The literature review showed that the factor of time constraints is a challenge consistently recognised in past studies that researched barriers to physical activity among South Asian migrants, particularly women in the Western part of the world (Caperchione et al., 2015; Hine et al., 1995; Lawton et al., 2006). Similarly, lack of time

was a challenge to engage in physical activity for participants in this study. Time constraints are seen as linked with a number of wider determinants of health such as lack of social support, low socioeconomic status and culture- and gender-related issues.

Lack of time, to a major extent, stems from family commitments as the caregiver. Past studies have also identified this issue as a challenge to physical activity (Babakus & Thompson, 2012; Hine et al., 1995; Sriskantharajah & Kai, 2007). The responsibilities of South Asian women as caregiver and house keeper of the family appear to be rooted in cultural and gender roles. With all their family commitments and work responsibilities, the participants were left with little or no time for physical activity. Research has revealed that marital status and parenthood have a negative impact on engagement in physical activity among women of many cultures (Marcus, Pinto, Simkin, Audrain & Taylor, 1994). The study findings show that among South Asian women, this is a prominent culture- and gender-related issue. Wong (2015) also states that female South Asians uphold their culture and traditions and they prioritise the needs of family before their own. Another aspect of this issue is lack of family and social support with family commitments and childcare leaving the women with less time for physical activity. Not having extended family around is also seen as related to lack of social support. Several participants cited that they receive encouragement and moral support from their families, especially from their spouses, to engage in physical activity more. However, a household labour division among spouse and adult children, which can help the women to have extra time to engage in physical activity, is seen as lacking.

Financial difficulties were identified as a barrier to physical activity among the participants and reflect the effect of socioeconomic status as a wider determinant of health on the levels of physical activity. As discussed in the introductory chapter, the

2006-2007 New Zealand health survey showed that South Asians were more likely to live in low socioeconomic status decile areas than New Zealand Europeans (Scragg, 2010). According to Marmot et al. (2010), the lower an individual's socioeconomic status, the worse his or her health condition; hence, this social gradient in health can have a significant impact on the quality of life of South Asians.

Even though some past literature identified that financial difficulties were related to physical inactivity among South Asians, it did not emerge strongly as a theme (Babakus & Thompson, 2012; Lawton et al., 2006). This study findings highlight the economic challenges to physical activity reflecting relatively high living costs in New Zealand. Migrants often find the cost of living in New Zealand is higher than they anticipated. The wages for some professionals may be lower compared to salaries for equivalent roles in Europe and the US, and due to physical location and small population, some imported goods are more expensive (Ministry of Business, Innovation and Employment, 2015b). Most participants cited that they are unable to join a gym due to high joining fees. Due to their low economic status, participants cannot afford to hire a nanny or domestic helper, which could ease their domestic responsibilities to spare time for physical activity. Moreover, due to financial demands, several women were compelled to find employment with long shifts and low wages, which are not relevant to their educational background and previous work experience. Some women stated that they have to travel far for work. All these constraints reduce their ability to engage in physical activity.

Social exclusion as a social determinant of health, coupled with financial constraints, is also recognised as a challenge to physical activity. The likelihood of South Asian job applications being excluded for the job interviews due to long South Asian names,

which are often difficult to read for Europeans, is voiced by some women. Hence, social exclusion is seen as interconnected with financial difficulties arising from unemployment.

Lack of social networking as a social determinant of health is highlighted in the study findings as a challenge to physical activity. Due to lack of social networking, most participants are not or less aware about the community physical activity programmes, restricting their access to these activities. The feeling of loneliness and isolation after migrating to New Zealand was voiced by many participants. Having family and peers nearby in their home countries, the women received support and encouragement to engage in physical activity, especially group activities. Several women stated that having someone to exercise with would motivate them to engage in physical activity. The issue of isolation is identified as closely related with a lack of sense of community among South Asian women in New Zealand, particularly for social activities. It appears from the findings that female South Asian migrants are getting together mostly for religious events. This was not seen to be highlighted as a theme in the past literature.

Not having spacious accommodation and gardens is also seen as posing challenges to engagement in household physical activity and facilitating sedentary lifestyle. This shows how housing and physical environment as social determinants of health are linked with challenges to physical activity. This issue is also interwoven with socioeconomic status as a wider determinant of health. In most cases, women and their families live in small houses with small or no gardens as they can't afford to rent or purchase spacious houses with gardens. The high cost of housing is seen as reducing the likelihood of owning or renting a spacious property. Since 2011, rents in Canterbury and Auckland have risen by 18.4 % and 14.4% respectively (New Zealand Government,

2016). Both increases were more than the national average (New Zealand Government, 2016). The government statistics also show that during this period, the price for the purchase of newly built houses in Auckland rose by 26.4 percent- an average annual increase of 4.8 percent (New Zealand Government, 2016).

Transport is seen as another social determinant which affects the level of physical activity. Frequent use of cars and less walking or using public transport was identified as posing challenges to physical activity. Many participants viewed the public transport system in New Zealand as not very efficient and therefore, they preferred driving rather than using a bus or train.

Physical environment in New Zealand as a wider determinant is also seen as affecting the level of physical activity and sedentary lifestyle. Cold weather during winter months was cited by many participants as a challenge to physical activity, particularly outdoor exercises. In a number of past studies, this was identified as a challenge to physical activity among South Asians in developed countries with a winter season (Babakus & Thompson, 2012; Caperchione et al., 2015; Lawton et al., 2006).

Cultural factors as a social determinant are also seen as linked with barriers to physical activity. For instance, fear of entering into mixed-gender physical activity settings was voiced by one participant. Prioritizing spiritual activities such as meditation over physical activities was also identified as influencing the level of physical activity. This issue warrants further research as spiritual priorities did not emerge as a theme in past studies.

5.3 Factors influencing sedentarism

The theme “couch potatoes” indicates a number of aspects of sedentarism, which are acting as challenges to physical activity. Lack of clear understanding of sedentariness is identified among the participants. Most women understood sedentary behaviour merely as physical inactivity or minimal physical activity. Few women were not aware of sedentary lifestyle. None of the participants had a clear understanding of the modern concept of “being physically active and yet sedentary”. Lack of motivation, willingness and commitment, and laziness are also identified as contributing to sedentarism and low levels of physical activity. Consistent with the findings of Babakus and Thompson (2012) and Lawton et al. (2006), unfamiliarity of neighbourhood and concerns about their safety made some participants sit home and become “couch potatoes”. Some workplaces are also seen as facilitating sedentary behaviour and posing challenges to physical activity. Frequent use of cars as discussed above also facilitates sedentariness. In light of these revelations about sedentary behaviour, it is seen that the issue of sedentariness, particularly the contemporary view of sedentariness, is an area for future research.

5.4 Facilitators to physical activity

Compared with the number of challenges identified, it appears that South Asian migrant women in New Zealand are encountering more challenges than facilitators to physical activity. Three major themes were identified in regard to facilitators influencing physical activity and sedentary behaviour: knowledge of the benefits of physical activity, encouragement and moral support from family and having more opportunities and facilities in New Zealand to engage in physical activity.

Knowledge of the positive effects of physical activity was identified as an enabler to physical activity in this study. Even though weight reduction and enhancing mental and physical health were recognised as motivators to physical activity in some of the past studies (Lawton et al., 2002; Jepson et al., 2012), lack of knowledge about the benefits of physical activity is reported as a challenge to engagement in physical activity among South Asian migrants, particularly women, in some other studies (Babakus & Thompson, 2012; Sriskantharajah & Kai, 2007).

Despite the educational and professional background, all the participants in this study were well aware of the importance of physical activity. However, consistent with the study findings of Lucas et al. (2013), lack of putting knowledge into practice is seen among the study participants due to the challenges outlined in the previous section. Hence, it can be argued that health literacy as a sole measure will not be beneficial in improving the level of physical activity, and other interrelated social determinants of health need to be addressed. Supporting this notion, the WHO (2012) views health promotion as a combination of the adoption of healthy public policies and health education activities. The WHO (2012) states that health education focuses on building individuals' capacities through educational and skill-building techniques, and healthy public policies provide the environmental support that will encourage and enhance behavioural change. Hence, it appears that both strategies are essential to enhance the level of physical activity among female South Asian migrants. Compared with past literature, family encouragement and moral support to engage in physical activity, and availability of more facilities to exercise in New Zealand, emerged strongly as themes in this study findings.

5.5 Recommendations to overcome the identified barriers and to strengthen the recognised facilitators

One of the most striking findings from this study is that many of the challenges to becoming more physically active are modifiable. As a link between challenges to physical activity and wider determinants of health is identified, it is necessary to address these wider determinants to overcome these barriers. This section introduces culturally and gender-appropriate strategies that can aid to improve the level of physical activity among migrant South Asian women in New Zealand. Changes can be made at family level, community and national levels to overcome the barriers and to strengthen the facilitators influencing physical activity and sedentary lifestyle among South Asian migrant women. Elements of key public health principles - equity, collaboration and empowerment - are seen as embedded in the suggested strategies (Baum, 2008).

5.5.1 Recommendations at family level

In view of the discussed study findings, it is evident that the primary focus of overcoming barriers to physical activity should be the family as the root cause of a number of issues lies within the family. Lack of time for physical activity due to family commitments can be overcome with the help of a simple act like household labour division among the spouse and adult children. Coupled with moral support and encouragement South Asian women receive from family, assistance with household work may have an immense impact on the ability of women to spare time to engage in physical activity. Therefore, women can be supported, encouraged and empowered to discuss the household labour division with family members. Such measures can help South Asian migrant women find extra time for physical activity without distorting the cultural image of South Asian women as caregivers. Supporting this notion, Wong (2015) points out that health promotion strategies need to be culturally appropriate and

be appreciative of the fact that South Asian women prioritise the family commitments and uphold their culture and traditions. Empowering individuals to take action for themselves can also be quite beneficial in improving their living and health status (Marmot et al., 2010; Baum, 2008). Measures such as using wearables for tracking activity and heart rate can be a self-motivation (El-Amrawy & Nounou, 2015). These devices are readily available for purchase in New Zealand.

Family members accompanying women to participate in physical activity can also facilitate South Asian women's engagement of physical activity. For instance, going for family walks, being a gym partner and taking yoga classes together. This might aid to alleviate the feeling of isolation which was identified as a barrier to physical activity. Seeing family members engaging in physical activity can also motivate women to be more physically active.

5.5.2 What can be done at community and national levels?

As lack of social networking and lack of sense of community among South Asian migrant women were identified as barriers to physical activity, programmes and group activities such as yoga, aerobics or swimming sessions, dance classes, gym sessions, sports days, sports clubs or even simply forming walking groups to promote physical activity can be organised at the community level. Past literature also identified collaborative group activities as a strong factor, which aids to build confidence in women who are reluctant to engage in physical activity (Jepson et al., 2012).

As anxiety and fear of entering into mixed-gender physical activity settings was also highlighted as a challenge to physical activity, a need for more gender appropriate physical activity programmes in female-only environments such as women-only fitness

centres, sports clubs and other activities, arise. According to the WHO (2017), gender appropriation refers to the socially constructed roles, behaviours, activities, and attributes that a given society considers appropriate for males and females. Few women-only swimming programmes such as Wellington Regional Aquatic Centre women-only swimming programme and Mount Roskill women's Swimming Programme are already available (Chhichhia et al., 2013; Wellington City Council, n.d.). However, more culturally appropriate programmes are needed at national level to improve the levels of physical activity among South Asian migrant women. A few women-only gyms are also available throughout New Zealand; however, due to high rates most women cannot afford to join them. Hence, a necessity of offering low-cost or free sessions for South Asian women with low socioeconomic status become apparent.

Educative programmes can be arranged at religious centres and work places. Even though lack of knowledge about physical activity and its benefits was not identified as a barrier, having educative talks and discussions on the importance of physical activity can enhance and refresh the awareness. Areas like sedentary lifestyle which are identified as lacking clear understanding, can also be explained and discussed during the educational talks. Having South Asian health professionals as the speakers could attract more women. During these programmes, sharing success stories of South Asian women who are from similar culture and living environment can motivate and empower other South Asian females to engage in physical activity. When coupled with other measures of addressing wider determinants linked with barriers to physical activity, health educational programmes can be beneficial.

Some interventions considered beneficial for improving physical activity among minority women in Scotland can be potentially be adapted to enhance physical activity

levels of South Asian migrant women in New Zealand. One of these measures is to use South Asian role models such as well-known sports personalities in promoting physical activity in local communities (Jepson et al, 2012; Jepson et al, 2008). Training people from minority communities to become walk leaders or fitness instructors which was also viewed in Scotland as effective in improving physical activity can be practised in New Zealand (Jepson et al, 2008). Another intervention attempted in Scotland and can be implemented in New Zealand is to introduce taster sessions for activities which South Asians do not commonly get involved in such as rock climbing, hill walking, cycling and gardening projects which can then be dovetailed into mainstream activities (Jepson et al, 2008). More female group activities such as Bollywood dance sessions which could appeal to South Asian women were also viewed as effective in Scotland in improving physical activity (Jepson et al, 2008). Such activities can also be attempted in New Zealand.

Social media can also be used as encouraging networks to share information about community physical activity programmes and to promote these events to enhance the access to these programmes. Leaflets with information about community physical activities can be distributed in work places, supermarkets, local shops and community centres for easy access by South Asian women. Sharing information about free exercise facilities in the neighbourhood such as parks, walking and cycling tracks can also aid to improve the physical activity levels among South Asian women. Raising awareness about facilities such as a childcare subsidy that helps low-income families with the cost of pre-school childcare can also aid to overcome lack of social support with caregiving responsibilities, which was identified as a barrier to physical activity (Ministry of Social Development, 2008).

Coburn and Weismuller (2012) state that uncovering of key health inequalities for migrant Asian groups including South Asians in New Zealand illuminates the challenges when assessing their health status. Concerns are raised that New Zealand health policies are mainly focusing on Maori and Pacific populations as at-risk groups for lifestyle disease, despite a high prevalence of lifestyle illnesses such as type 2 diabetes and cardiovascular diseases among South Asian populations (Kolt et al., 2007; Rasanathan, Tse, et al., 2006). Moreover, South Asian migrants are rarely identified as a priority group in current strategies for lifestyle diseases (Rasanathan, Tse, et al., 2006). Hence, at national level, strategies need to be implemented to minimise health inequalities among South Asians migrants.

Reducing socio-economic disparity in health status among populations can minimise losses from diseases associated with health inequalities such as productivity losses, higher welfare payments and treatment costs (Marmot et al., 2010). This draws public health policy makers' and other relevant authority figures' attention to the necessity of initiating measures at national level to reduce the burden of lifestyle illnesses among this ethnic group. Moreover, as low physical activity levels were identified as closely linked with the higher rates of lifestyle diseases among South Asian migrants, particularly women, allocating more budget for initiatives focusing on assisting physical activity among South Asian female migrants by overcoming the identified barriers can be beneficial. Currently, a deficit is seen in the initiatives focusing on South Asian health promotion; hence, more health promotion programmes such as the Mt Roskill HEHA (Healthy Eating, Health Action) programmes, which was a community-driven project for South Asians, are needed at national level (Wong, 2015).

More research in this area would also be greatly beneficial. There is a need for larger scale research on the issue of physical inactivity and sedentary lifestyle among South Asian migrant women and also among South Asian migrants as a whole including males. Participatory action research, with its partnership approach to the research process, and focus on uncovering underlying causal mechanisms and empowerment may be particularly valuable (Cornwall & Jewkes, 1995). As communities are sets of complex power relations and social hierarchies, recognising community needs and gaps creates a momentum for strategies to improve the level of physical activity by getting South Asian community input (Cornwall & Jewkes, 1995).

In light of the above discussion, it is seen that other than the government's financial support and changes in public health policies, empowering South Asian women and the community to take action to improve the level of physical activity can also play a major role in overcoming many of the identified barriers to physical activity.

5.6 The benefits of the research to the public health arena

In regard to immediate and short term benefits of this study, the recommendations may be used to increase individual and community awareness about ways to improve the engagement in physical activity. At national level, the proposed suggestions may also use to draw public health policy makers' attention to the necessity of initiating more culturally and gender-appropriate public health policies and programmes to overcome the identified cultural, social, economic and environmental challenges to physical activity. The study findings can also help to draw more attention of the current programmes such as Healthy Auckland Together, which is attempting to increase physical activity among Auckland communities, towards South Asian communities (ARPHS, 2011). The information about identified enablers to physical activity may be

used to implement strategies to strengthen these enablers to enhance the current level of physical activity among South Asian migrant women. The study findings will be disseminated to relevant authorities and organisations such as the Auckland Regional Public Health Service (ARPHS), Counties Manukau DHB and other DHBs, Diabetes New Zealand, The Asian Network Incorporated (TANI), and other South Asian community centres.

In terms of long term benefits, it is expected that measures aimed at improving the level of physical activity, in the long run, will aid to reduce the burden of preventable or modifiable lifestyle diseases such as cardiovascular conditions and type 2 diabetes among South Asian migrant women. As South Asian women are the caregivers of the family, good health of women can aid to build a healthy South Asian community. This may help to decrease the budget allocated for health services related to these lifestyle illnesses, financially benefitting the government. This research can also act as a framework to conduct further research in the area of physical activity and sedentary lifestyle, and South Asian health.

5.7 Limitations of the study

Even though the study explored the challenges and facilitators of physical activity and sedentary lifestyle among South Asian migrant women in New Zealand, only the participants who are currently residing in Auckland were included. This can be justified to some extent as the highest concentration of South Asian migrants is found in Auckland.

The participants were from three main South Asian ethnicities: Indian, Sri Lankan and Pakistani. While attempts have been made to keep a maximum possible variation of the

sample, due to the small study sample, a wider variation of the sample in terms of ethnicity was not possible. In regard to the educational status of the participants, all the respondents hold higher educational qualifications and most of them have a health professional background. Not including participants from a range of educational levels could also be seen as a limitation.

5.8 Summary of the thesis

This qualitative descriptive study was conducted to fill the knowledge gap identified in the past literature by answering the research question, what are the challenges and facilitators influencing physical activity and sedentary lifestyle among South Asian migrant women in New Zealand? From the study findings, it is evident that the study has accomplished its goal as a number of challenges and facilitators to physical activity and sedentary lifestyle particularly relevant to the New Zealand environment were revealed. The study also presents an in-depth discussion of the findings, introducing suggestions to overcome the identified challenges and to strengthen the recognised facilitators. A need for culturally and gender-appropriate public health policies to improve the engagement of physical activity among South Asian migrant women in New Zealand, which may ultimately aid in reducing the burden of lifestyle diseases, was highlighted. Every possible step was taken to ensure the trustworthiness of this research project. With all the strengths of the study, few limitations were also noted. Finally, this study can be seen as drawing the attention of New Zealanders to public health issues among minority women.

Thank you!

ස්තූතියි (Thank you in Sinhala)

धन्यवाद (Thank you in Hindi)

آپ کا شکری (Thank you in Urdu)

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APPENDIX A: ETHICAL APPROVAL

16 March 2016

Erica Hinckson
Faculty of Health and Environmental Sciences

Dear Erica

Re Ethics Application: **16/09 Challenges and facilitators influencing physical activity and sedentary lifestyle among South Asian migrant women in New Zealand**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 14 March 2019.

As part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/researchethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 14 March 2019;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/researchethics>. This report is to be submitted either when the approval expires on 14 March 2019 or on completion of the project.

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to obtain this.

To enable us to provide you with efficient service, please use the application number and study title in all correspondence with us. If you have any enquiries about this application, or anything else, please do contact us at ethics@aut.ac.nz.

All the very best with your research,



Kate O'Connor
Executive Secretary
Auckland University of Technology Ethics Committee

Cc: Wasani Silva ruwanthi222@gmail.com



STUDY INVITATION

Invitation to participate in a research project exploring,

“Challenges and facilitators influencing g physical activity and sedentary lifestyle in South Asian migrant women”

We would like to hear from South Asian female migrants aged 20-60 years who are interested in participating in this fascinating project.

(South Asian countries:-Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan, Afghanistan, India, Maldives)

More details of this study can be found by contacting

Wasani Silva

0210-2555679

ruwanthi222@gmail.com

APPENDIX C: PARTICIPANT INFORMATION SHEET

Date Information Sheet Produced: 17 December 2015

Project Title

Challenges and facilitators influencing physical activity and sedentary lifestyle among South Asian migrant women in New Zealand

An Invitation

I am Wasani Silva, a post graduate student at school of public health, AUT. You are invited to take part in a research project investigates the challenges and facilitators influencing physical activity and sedentary lifestyle among female South Asian migrants in New Zealand. This research will be conducted by me for the completion of a Master of Public Health degree. Your participation in this study is entirely voluntary and you may withdraw your participation at any time prior to the date of completion of data collection, **30th May 2016**.

What is the purpose of this research?

This research study aims to understand the challenges and facilitators influencing physical activity and sedentary lifestyle among South Asian migrant women in New Zealand. It also attempts to understand the current level of physical activity among them. The findings of the study will also contribute to the knowledge of the social, economic, cultural and environmental challenges South Asian migrant women face finding enough time for physical activities and the health issues they suffer as a result of sedentary lifestyle. This information can be used to create more effective services which assist South Asian migrant women to improve the level of physical activities. The information gather from you will only be reported as group responses without revealing your identity. The findings will be written-up as a thesis to complete a master of public health. The results will also be presenting to relevant national organizations, and academic journals.

How was I identified and why am I being invited to participate in this research?

You are identified as a potential participant for this study through a friend or a colleague of the primary researcher. You are invited to participate in this research because you are:

- Female South Asian migrant aged 18-65 years
- currently residing in Auckland
- Have resided in New Zealand for more than a year
- Able to clearly communicate with the researcher in English

You will be excluded as a participant in this research if you are,

- suffering from neurocognitive impairment- (mild cognitive impairment, dementia, delirium, amnesia)
- suffering from any major medical or surgical conditions which are considered absolute contraindications to physical activity

What will happen in this research?

If you consent to take part, you will be asked to spend about an hour to be interviewed by the researcher about the research topic. A note-taker may present in the interviews. The interview includes information about your current level of physical activity, social, cultural and environmental factors challenging or facilitating your engagement in physical activity. You may decide not to reveal any information which you may not feel comfortable sharing with the researcher. The planned timing for the event includes the time for you to get to know the researcher prior to the interview. The interview will be digitally recorded.

On the day of the interview, you will be asked to complete two forms: a questionnaire to collect physical activity and sedentary behavior data, and a form to obtain demographic data.

Once the interview transcriptions are available, you will be contacted a second time via email. You can read the transcript and see if there is any additional information that you would like to add or if there is any information that needs to be changed. You would spend about 30 minutes for this task.

What are the discomforts and risks?

As a migrant woman facing challenges to survive in a country with a different cultural, environmental and socio-economic status, you may feel uncomfortable or distressed talking about your challenges to physical activities or about your health conditions which may negatively influence your engagement in physical activity.

How will these discomforts and risks be alleviated?

If you feel distressed at any time during the interview, the recording will be stopped and you may take some time to de-stress. You can then decide if you wish to proceed with the interview or not, as you may withdraw from the study at any time before the completion of data collection. If a necessity of counselling arises, you will be informed about the counselling services available at AUT.

What are the benefits?

You will receive a copy of the summary of findings upon your request. Your information will be useful to understand the current level of the physical activity among South Asian migrant women and the challenges and facilitators influencing their physical activity and sedentary lifestyle. The information can also contribute to initiate effective culturally and gender-appropriate services for women and their families to improve the level of physical activity.

What compensation is available for injury or negligence?

In the unlikely event of a physical injury as a result of your participation in this study, rehabilitation and compensation for injury by accident may be available from the Accident Compensation Corporation, providing the incident details satisfy the requirements of the law and the Corporation's regulations.

How will my privacy be protected?

Only the primary researcher and the supervisor will have access to the recorded interviews and the transcripts. You will not be identified as a study participant in transcripts, research findings or in any of the research articles, reports or publications.

What are the costs of participating in this research?

About an hour of your time for an interview and about 30 minutes for reading the transcript will be the only cost to you taking part in this study. The date, time and venue for the interview will be arranged as per your convenience. If any transport cost incurs, the cost will be reimbursed to you.

What opportunity do I have to consider this invitation?

You are requested to inform the primary researcher if you would like to take part in the study within two weeks of receiving this information sheet.

How do I agree to participate in this research?

A consent form will be completed to participate in this research study. This form will be provided to you by the primary researcher. Once the consent form is completed you will be contacted by the primary researcher.

Will I receive feedback on the results of this research?

Once the interview transcripts are available, you will be sent a copy via email. On completion of the project, a copy of the summary of findings will also be sent to you, upon your request.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Project Supervisor,

Supervisor's name: Dr Erica Hinckson

Email address: erica.hinckson@aut.ac.nz

Work phone number: 921 9999 ext 7224

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTECH

Kate O'Connor,

ethics@aut.ac.nz ,

921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows: Primary researcher's name: Wasani Silva

Contact details: ruwanthi222@gmail.com

Project supervisor's name: Dr Erica Hinckson

Contact details: 021960887

Researcher Contact Details:

Wasani Silva

ruwanthi222@gmail.com

Project Supervisor Contact Details:

Dr Erica Hinckson

Erica.hinckson@aut.ac.nz

Approved by the Auckland University of Technology Ethics Committee on – 16/03/2016

AUTECH Reference number – 16/09

APPENDIX D: CONSENT FORM

Project title: *Barriers and facilitators influencing physical activity and sedentary lifestyle among South Asian migrant women in New Zealand*

Project Supervisor: *Associate professor Erica Hinckson*

Kate Kersey

Researcher: *Wasani Silva*

- ☐ I have read and understood the information provided about this research project in the Information Sheet dated 21/04/2016
- ☐ I have had an opportunity to ask questions and to have them answered.
- ☐ I understand that notes will be taken during the interviews and that they will also be digitally recorded and transcribed.
- ☐ I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.
- ☐ If I withdraw, I understand that all relevant information including tapes and transcripts, or parts thereof, will be destroyed.
- ☐ I agree to take part in this research.
- ☐ With regards to collecting data about the current level of physical activity,
I agree to answer the questionnaire ☐
- ☐ I wish to receive a copy of the summary of findings (please tick one): Yes ☐ No ☐

Participant's signature:

Participant's name:

Participant's Contact Details (if appropriate):

.....
.....
.....
.....

Date:

Approved by the Auckland University of Technology Ethics Committee on- 16/03/2016

AUTEC Reference number-16/09

Note: The Participant should retain a copy of this form.

APPENDIX E: DEMOGRAPHIC DATA FORM

Demographic Data	
Name	.....
Age	.....
Address	..........
Ethnicity	.....
Religion	.....
Occupation	.....
Level of education	.....
Marital status	.....
Number of children	.....
How old are the children (if applicable)	.....
Date of arrival to New Zealand	.....
Height (self-reported data)	.....
Weight (self-reported data)	.....
Do you suffer from any of the following	
Conditions	
	High blood pressure
	Type 2 diabetes
	High blood cholesterol
Yes	No
(If yes, please tick the relevant conditions)	

APPENDIX F: QUESTIONNAIRE GUIDED BY THE INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE

QUESTIONNAIRE ABOUT PHYSICAL ACTIVITY IN A USUAL WEEK USING THE IPAQ AS A GUIDE

JOB-RELATED PHYSICAL ACTIVITY

In a usual week,

How many days do you do vigorous physical activities as part of your work?

How much time do you usually spend on one of those days doing vigorous physical activities as part of your work?

How many days do you do moderate physical activities as a part of your work?

How much time do you usually spend on one of those days doing moderate physical activities as part of your work?

How many days do you walk as part of your work?

How much time do you usually spend on one of those days to walk as part of your work?

TRANSPORTATION PHYSICAL ACTIVITY

In a usual week,

How many days do you travel in a motor vehicle like a train, bus, car or tram?

How much time do you usually spend on one of those days traveling in a car, bus, train or other kind of motor vehicle?

How many days do you use bicycle to go from place to place?

How much time do you usually spend on one of those days to bicycle from place to place?

How many days do you walk to go from place to place?

How much time do you usually spend on one of those days walking from place to place?

HOUSEWORK, HOUSE MAINTENANCE AND CARING FOR FAMILY

In a usual week,

How many days do you do vigorous physical activities in the garden or yard?

How much time do you usually spend on one of those days doing vigorous physical activities in the garden or yard?

How many days do you do moderate activities in the garden or yard?

How much time do you usually spend on one of those days doing moderate physical activities in the garden or yard?

How many days do you do moderate activities inside your home?

How much time do you usually spend on one of those days doing moderate physical activities inside your home?

LEISURE TIME ACTIVITY

In a usual week,

How much time do you usually spend on one of those days walking in your leisure time?

How many days do you do vigorous physical activities in your leisure time?

How much time do you usually spend on one of those days doing vigorous physical activities in your leisure time?

How many days do you do moderate physical activities in your leisure time?

How much time do you usually spend on one of those days doing moderate physical activities in your leisure time?

How much time do you usually spend sitting on a weekday?

How much time do you usually spend sitting on a weekend day?

