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**Foot health related quality of life of patients utilizing podiatric
services at public health care facilities in Gauteng,
South Africa**

A dissertation submitted to the Faculty of Health Sciences, University of
Johannesburg, in fulfilment of the requirement for the degree of Master of
Technology: Podiatry by

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ABSTRACT

The role of a podiatrist is to identify, diagnose and treat disorders, disease and deformities of the feet and lower limbs. The podiatrist not only provides timely symptomatic relief but is also responsible for ensuring additional care such as monitoring foot health status, providing health education and acting as gatekeepers to other members of a multidisciplinary team, ultimately leading to an improved quality of life for the patient (Rome *et al*, 2009:1, 5, 7).

The aim of this study was to measure foot health related quality of life of patients utilizing podiatric services at various health care facilities in Gauteng, South Africa. A prospective quantitative design had been selected for this study. The reason for a prospective design was that the information required was unlikely to be readily available or complete within the pre-existing historical patient care records. For this study, a two sectioned questionnaire had been used, and included a validated Foot Health Status Questionnaire that measured the foot health related quality of life (Bennett and Patterson, 1998:87), with a section that determined podiatric consultations, diagnoses, treatment and referral pathways.

Literature has highlighted that foot pain and poor foot function can have a detrimental effect on a patients' quality of life, thereby a negative impact on foot health related quality of life. The results of this study have indicated that the foot health status of participants varied and many correlations were made regarding foot pain, foot function, general foot health, footwear and generic health. The results have also indicated that the majority of patients who consulted at the various Podiatry Departments within the public healthcare clinics in Gauteng have some level of foot pain and poor foot function. It appeared that new patients presented with a poorer general foot health than follow up patients. The most common diagnoses made at the various Podiatry Departments was dermatologically related and the most frequent treatment offered was routine podiatric care. The highest number of podiatric referrals made to Podiatry was by the various Endocrinology

Departments. The majority of participants that had consulted with the Podiatrists were referred back to the Podiatry Departments for routine podiatric care.

No clinical audit has been done measuring foot health related quality of life of patients utilizing podiatric services at various health care facilities in Gauteng, South Africa. The absence of information and data justifying the need for and impact of podiatrists within the public sector makes it difficult to argue for the growth and expansion of the profession within the country.





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DEDICATION

I dedicate this dissertation to my family for the continuous love and support, Bhupendra Purbhoo, Rohini Purbhoo, Ushir Purbhoo, Naina Bhawan, Vishal Bhawan, Rahil Bhawan, Arya Bhawan and Meelin Makan for all the support and assistance.

In loving memory of my grandparents, Baboo Purbhoo, Vanita Purbhoo and Natvarlal Parbhoo and Shanti Parbhoo.

In loving memory of my late aunts Mrs Manjula Prag and Mrs Prashila Dalpat.



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CHAPTER 1: INTRODUCTION AND BACKGROUND

1.1. INTRODUCTION

The following Chapter will provide an introduction and overview of the study. It also briefly introduces the role and importance of Podiatrists in maintaining foot health.

1.2. BACKGROUND

The role of a Podiatrist is to identify, diagnose and treat disorders, diseases and deformities of the feet and lower limbs. The Podiatrist not only provides timely symptomatic relief but is also responsible for ensuring additional care such as monitoring foot health status, providing health education and acting as gatekeepers to other members of a multidisciplinary team, ultimately leading to an improved quality of life for the patient (Rome *et al*, 2009:1, 5, 7).

The vision of the Society of Chiropractors and Podiatrists in the United Kingdom (2010: 2) in response to various challenges faced in public health care was to increase the quality of care to patients, to arrest preventable foot problems by empowering patients towards self-care, reducing secondary care interventions, to prevent immobility and to promote foot health education. Various case studies and good practice models developed at various public health care facilities in the UK, as highlighted by The Society of Chiropractors and Podiatrists (2010: 1-19), have identified the following: measurable improved patient outcomes, decreased waiting times for appointments, reduced amputation rates, improved multidisciplinary teamwork and staff morale, more timely and comprehensive assessments, diagnostics and education, reduced hospital admissions and stays, improved patient involvement and compliance and most importantly, cost effectiveness.

It has been noted by the Department of Health (South Africa, 2011(a): 9) that the majority of the South African population relies on public health care. According to A Policy on Quality in Health Care for South Africa (South Africa, 2007:23), clinical audits are necessary as it encourages a multidisciplinary approach in allowing all health care professionals to consider clinical evidence, promote research and education, develop and implement rules, regulations and policies, adequate and essential management skills and economical use of resources.

1.3. RATIONALE / CONCEPTUALIZATION OF THE PROBLEM

Foot health is important in maintaining a patient's overall health and well-being. Infection, ulceration, amputation, and disabling foot pain leads to immobility, dependence and decrease in the patient's quality of life (QoL) and therefore highlighting that Podiatry services remain pivotal within the health care framework of a country (The Society of Chiropodists and Podiatrists UK, 2010:17).

The absence of information and data highlighting foot health related quality of life (foot HRQoL) in patients utilizing podiatric services in South Africa, thereby justifying the possible need for and impact of Podiatrists within the public health sector, makes it difficult to argue for the growth and expansion of the profession within the country.

1.4. RESEARCH STRATEGY

A prospective quantitative design was selected for this study and aimed to determine the foot HRQoL in patients seen at public health care facilities in Gauteng, South Africa. The investigation followed a prospective design as the information required was not readily available or complete within the pre-existing historical patient care records.

A clear indication of the aims and objectives of the study was provided and the research commenced on approval from the Higher Degrees and Academic Ethics Committee of the Faculty of Health Sciences at the University of Johannesburg (Appendix A) and written consent granted by the Chief Executive Officer (CEO) or Directors of each of the participating health care facilities (Appendix B). To ensure patient confidentiality, patients' names, file numbers and contact details were not required to be documented during data collection. Informed consent was sought by patients and Podiatrists working at the seven health care facilities included in this study (Appendix C). The questionnaire (Appendix D) was coded numerically. Access to the data obtained was limited solely to the researcher, supervisor and co-supervisor. Precautions were taken to store the data electronically using a password-protected format, accessible only by the researcher, supervisor and co-supervisor to ensure information was not disclosed to any unauthorized individual/s.

The total sample included patients seen by Podiatrists on a monthly basis in public health care facilities in Gauteng. The number of patients seen on a monthly basis varied from one health care facility to the next. The number of patients seen ranged from 60 to 250 patients per month per Podiatrist. Approximately 2 000 patients may be seen at the seven various health care facilities in Gauteng within a two month period. The sample size for the purposes of this project included a minimum of 200 participants. This number was deemed sufficient as data gathered would be statistically viable. The sampled population included all outpatients that present for podiatric treatment at the Podiatry Departments at the various health care centres in Gauteng, South Africa. In-patient/ward patients seen by Podiatrists were excluded from the study.

For the purposes of this study, the sampled population was obtained from seven public health care facilities providing Podiatry services within Gauteng, South Africa, ranging from Tertiary, Central, Regional and District hospitals; Community Health Centre's and Primary Health Care Clinics namely:

- Chris Hani Baragwanath Hospital;
- Charlotte Maxeke Johannesburg Academic Hospital;
- Tambo Memorial Hospital;
- Rahima Moosa Academic Hospital;
- Helen Joseph Hospital;
- Alexandra Health Centre and University Clinic; and
- The Riverlea Community Health Clinic.

Data was collected using a validated Foot Health Status Questionnaire (FHSQ), with section two of the questionnaire being specifically structured and pre-tested to gather further information relating to the aims and objectives of this study, to ensure reliability and consistency. Data was collected by Podiatrists over an eight week period or until the required proportionate representative sample size was reached. Based on preliminary investigations it was argued that this time period was sufficiently reflective of the typical caseload seen at the seven public health care facilities under investigation. A pilot plan to ensure validity and reliability of data collection took place where data was collected on a total of ten patients, whose results were not utilized in the study.

The questionnaire consisted of two sections. The questions in the questionnaire determined patient's foot health within four domains namely:

- Foot pain;
- Foot function;
- Footwear; and
- General foot health.

It also addressed standard demographic data and variables such as:

- Gender;
- Age;
- Socio-economic status;
- Co-morbidities;

- Service utilization;
- Podiatric diagnoses and management; and
- Referral pathways.

Section A is an internationally validated questionnaire, however, Question 25 was modified during data collection, as South African citizens are not seen as health care cardholders. Comparisons and correlations of the data were made by statistical analysis. The data obtained were presented by main categories (demographic and clinical), and divided into subcategories (age, gender, diagnoses as well as treatment at initial visit and at each follow-up). The spectrum of patient visits, including changes in trends occurring in the categories and subcategories has been explained statistically using descriptive analyses and frequencies (percentages). Cross tabulations were used to establish if any co-dependent relationship/s exists between two or more of the subcategories.

1.5. PROBLEM STATEMENT

Foot problems have a negative impact on the social, physical and mental functioning of a patient thus leading to a decreased QoL (Menz, 2008: 8-9). Prior to this study there had currently been no clinical audit done or relevant data collected measuring foot HRQoL of patients utilizing podiatric services at various health care facilities in Gauteng, South Africa.

1.6. AIMS AND OBJECTIVES

The aim of this study was to measure foot health related quality of life of patients utilizing podiatric services at various health care facilities in Gauteng, South Africa, in order to increase the evidence base for this area of health care. In order to achieve the aim stated above, the following research objectives have been identified:

- To determine patient's foot health status/ foot health related quality of life within four domains namely, foot pain, foot function, footwear and general foot health;
- To capture generic measures of the patient's health; and
- Make recommendations on the way forward.

In addressing the above, standard demographic data and variables such as gender, age, socio-economic status, co-morbidities and service utilization has been identified. Furthermore, identifying and comparing the foot health status of new patients to follow up patients; categorizing the patient's podiatric diagnosis and management/treatment at the time of current consultation, determining and establishing the patient's pathway of referral to and from Podiatry and the reasons thereof, determining a link or co-dependency between foot health related quality of life, demographics, clinical characteristics and referral pathways.

1.7. CONCLUSION

The study aimed to offer insight into the patient's QoL based on the foot health status of the patient, thereby highlighting the need for Podiatry services in South Africa.

CHAPTER 2: LITERATURE REVIEW

2.1. INTRODUCTION

The following Chapter provides an overview of the South African health care system, the types of public health care facilities in South Africa, the history of Podiatry in South Africa and within the health care system, foot HRQoL and information surrounding similar international studies that have been conducted.

2.2. LITERATURE REVIEW

2.2.1. QUALITY OF LIFE (QoL)

As stated by Felce and Perry (1995: 51-74), QoL has been defined in various contexts within literature. However, the World Health Organization (WHO) has defined the assessment of a patient's QoL under the following categories (Skevington *et al.*; 2004: 299):

- The individual's perceptions in context of their culture and value systems;
- The individual's personal goals; and
- The individual's standards and concerns.

It has also been stated that in order to measure a patient's QoL there needs to be an integration of objective and subjective indicators and the development of various tools of measurement. Brown *et al.* (2004: 46) states that QoL can integrate or involve many domains such as *"a person's physical health and functioning, psycho-social well-being, psychological outlook, psychological and social role functioning, social support and resources, independence, autonomy and perceived control over life, material and*

financial circumstances, community social capital and the external environment, including the political fabric of society”.

A systematic review of literature by authors Brown *et al.* (2004:78-86), focused on the perceptions of older people regarding the components of QoL. The following components were identified:

- Family relationships;
- Relationships with others;
- Emotional well-being;
- Religion/spirituality;
- Independence;
- Mobility and autonomy;
- Social activities and the community;
- Finances;
- Personal health
- Health of others; and
- QoL in institutional care.

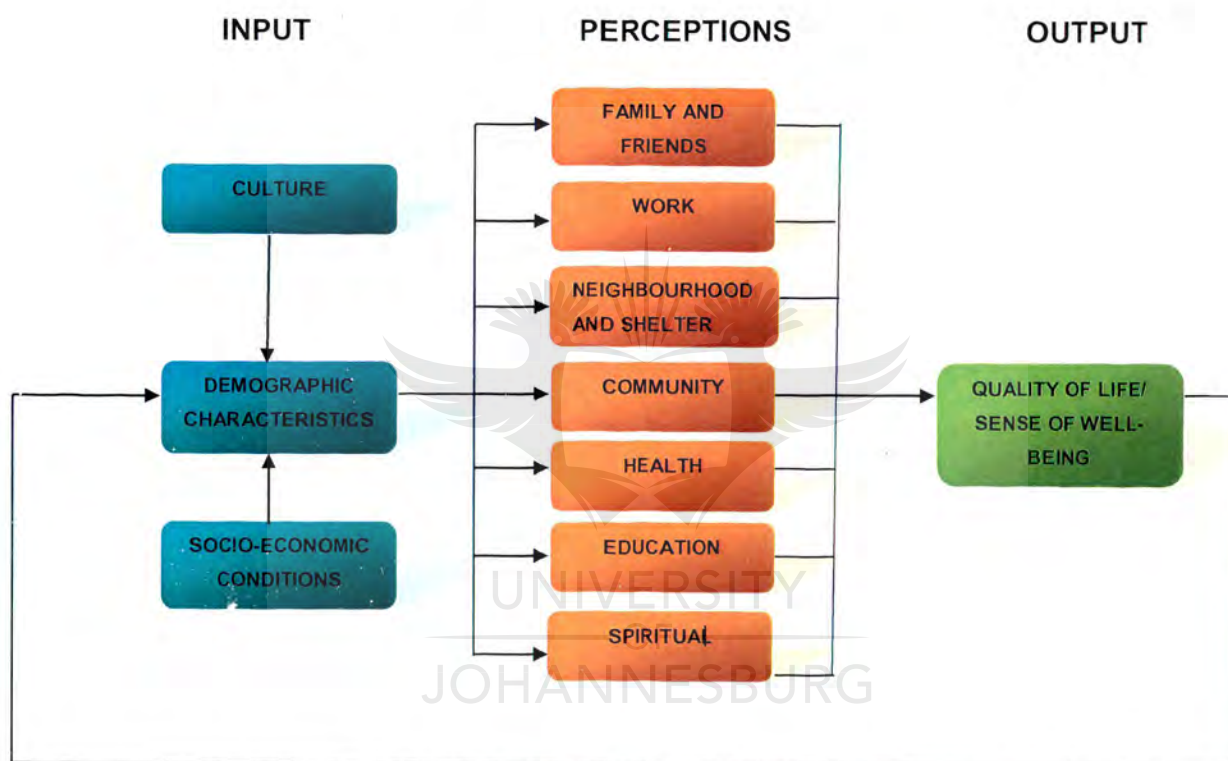
A systems model represented by the Figure 2.1 of the University of Oklahoma School of Social Work (no date, no page number), shows similar types of components, however, taking into consideration work and education.

2.2.2. HEALTH STATUS AND HEALTH RELATED QUALITY OF LIFE

Health status or health related quality of life (HRQoL) are interchangeable terms that overlap. Health status, considered to be one domain of HRQoL, initially focused on a patient's physical morbidity and mental health. However, these concepts now both focus on physical health, physical functioning, social health and functioning, psychological and emotional well-being and perceptions (Bowling, 2002:13-15). This author also states that

measuring QoL, health status and HRQoL can be a complicated task, as there are many interrelated variables such as self-esteem, social and cultural values, personal circumstance of an individual and many more.

Figure 2.1.: Quality of life: A systems model



(The University of Oklahoma School of Social Work, no date, no page number)

Measuring health outcomes, according to Roach (2006:8-12), helps to identify the type of patients that would greatly benefit from particular medical interventions provided. Bowling (2002:13-15), states that measuring HRQoL considers the impact of the condition or treatment on a patient's physical, emotional and social well-being and lifestyle and also states that in order to accurately measure these outcomes, it is vital that the tool of measurement be accurate, precise, sensitive and allow for change. To measure QoL in research on health or health care the information gained should be able to determine the

effects of the condition and treatment on the patient's daily and long-term life; also to determine whether there is in fact an improvement or decline in QoL in patients with life-threatening conditions.

Literature has identified that an individual who has general good health, physically and mentally, has an associated higher well-being, morale and ultimately a better QoL (Brown *et al.*, 2004: 32). These authors also state that the concepts of HRQoL have been based on a "*Pathology/ Disease model of ill-health and dependency*". This model takes into consideration how systemic disease effects the measurements of mental and physical well-being, disabilities and overall functioning of an individual.

2.2.3. FOOT HEALTH RELATED QUALITY OF LIFE

2.2.3.1. THE EFFECTS OF FOOT PAIN, FOOT FUNCTION, FOOTWEAR AND GENERAL FOOT HEALTH, ON HEALTH RELATED QUALITY OF LIFE

A study conducted in Australia identified that approximately one in five people, mainly females over the age of 50 years and older and those classified in the obese category reported foot pain. However, 10 % under the age of 45 years reported foot pain as well. It was also found that the reported foot pain in this population were located in the hindfoot, forefoot, toes, arch and nails. The study also found that there was a high correlation of foot pain in patients with chronic disease like diabetes, cardiovascular disease and osteoporosis. The authors speculated that in older patients' foot pain was most likely due to toe deformities, corns and calluses, whereas in younger patients foot pain could be attributed to musculoskeletal pathology.

Foot pain is highly prevalent in all age groups and has a negative effect on a person HRQoL (Hill *et al.*; 2008: 1-7). As cited by Ferreira *et al.* (2008: 595), patients with foot pain and deformity have an increased risk of falling due to impaired balance that may lead to functional deterioration. This ultimately could lead to a decline in their HRQoL and

independence. Foot problems have a negative impact on the social, physical and mental functioning of a patient thus leading to a decreased QoL (Menz, 2008: 8-9). Footwear plays an important role in protecting feet against extreme temperatures, moisture and trauma, however, it can also have detrimental effects that may lead to foot deformity, immobility and a poor QoL (Menz, 2008:235-236).

2.2.4. FACTORS INFLUENCING THE DEVELOPMENT OF FOOT SYMPTOMS

Risk factors for developing foot problems as identified by Menz (2008:5-7) includes the patients age, sex, co-morbidities, ethnicity and socio-economic status. According to Menz (2008:5-7) an increase in age leads to an increase in foot problems, with women having a higher prevalence due to the wearing of certain types of footwear. Various co-morbidities such as diabetes, rheumatoid arthritis, obesity, stroke and systemic sclerosis leads to an increase in foot symptoms. However, the role of socio-economic status and ethnicity in relation to foot symptoms still remains an area that needs further investigation.

2.2.5. PODIATRY IN SOUTH AFRICA

Podiatry, being a relatively new profession in South Africa as compared to other countries around the world, only started its training school in 1977 at the then Witwatersrand College for Advanced Technical Education, leading to a three year National Diploma in Chiropody which later, during the eighties, resulted in the establishment of the Department of Podiatry at the institution then renamed Technikon Witwatersrand. In 1988, the course became a National Higher Diploma and subsequently in 1995 became the four year Bachelors of Technology Degree in Podiatry (Zipfel, 2001:35-36).

According to the latest HPCSA statistics the number of Podiatrists in the country totalled 224, making up 0.15 % of the health professionals registered with the HPCSA. Rehbock

(2008:66) highlights that no more than 50 Podiatrists work within the public sector and this is of great concern as 82% of the public is dependent on public facilities.

2.2.6. SOUTH AFRICAN HEALTH CARE SYSTEM

The majority of the South African population rely on public health care, however only 40% of total expenditure is spent towards this sector. A Policy on Quality for Health Care for South Africa states that any national policy must include problems faced in both private and public sector in order to strengthen the relationship (South Africa, 2007:1-2). According to the Health Budget Vote Speech, South Africa spent 8.7% of its Gross Domestic Product (GDP) on health, of which the bulk was spent in the private sector (South Africa, 2011 (b)). The report also noted that this posed a major problem as public health care provided services to 82% of the population whilst only 18% of the population made use of private health care.

The 2013 Budget Speech (South Africa, 2013 (a): 8) highlights that the growth of the South African economy will rise, with a GDP of 2.5% from 2012 to a projected 3.8% by 2015. The budget also includes a combined spending on health and social protection of R268 billion in 2013/14, health infrastructure remaining a priority. A total of 1 967 health care facilities and 49 nursing colleges were in different stages of planning, construction and refurbishment in 2012 (South Africa, 2013 (a): 27). The South African Health Review 2012/13 (South Africa, 2013 (b): 273) reported that the average annual growth of public sector expenditure has increased greatly, with a growth of 8.5% from 2007/08 to 2011/12.

The need for measurable objectives by health care practitioners is essential to be able to monitor progress (South Africa, 2007: 2-6). It also identified and reported that most public hospitals lack adequate and sometimes essential infrastructure, resources, staff, industrial relations and managerial skills, which, unless rectified result in inadequate health care services provided (South Africa, 2007: 11-24). The goal is to develop and

provide all South Africans with a comprehensive national health services that's easily accessible.

The National Department of Health Strategic Plan 2010/2013 (South Africa, 2010 (a) :5) stated that due to the global recession it is imperative that policy objectives for building a new growth path for the country should include making the economy more labour-absorptive, promoting health care, education and training. The government aims to improve health care nationally by addressing issues like access, reducing health care errors, increasing patient participation, expanding research on evidence and effectiveness, appropriate use of services and reducing pathology and disability through prevention and health education and reflecting the needs for the specific population groups and areas (South Africa, 2007: 2).

One of the major problems that have plagued Podiatry in South Africa is the poor recognition and exclusion of the profession within the national health care framework of the country. The White Paper for the Transformation of the Health System in South Africa, (South Africa, 1997: 23) identified various categories of health care workers to appear on the priority primary health care services to be provided through the district health system, in which Podiatry did not feature. In 1998, Podiatry was placed within the District Health services however, and as noted, was not seen as a priority primary health care service or a profession that was essential to the population of South Africa. According to Masoetsa (2005: 9), posts within the health care system for Podiatrists at the time were frozen due to the following:

- Financial constraints;
- The lack of knowledge about the profession by the Department of Health and the public; and
- The lack of communication and marketing strategies and evidence-based research by the profession.

By 2001, the minimal amount of Podiatrists scattered within a few public hospitals were seeing patients presenting with a large variety of conditions and these hospitals served as a primary, secondary and tertiary referral centre for patients utilizing public health care (Reay, 2001:529). Since 2001, there has not been any significant changes.

The Health and Social Development Service Transformation Plan for Gauteng (South Africa, 2010 (b): 219), places Podiatry as one of the health care professions to provide tertiary services within the rehabilitation centres, to all tertiary level hospitals. However, according to the public hospital staff complement data sheet as per March 2010 of all Tertiary, Central, Regional and District hospitals; Community Health Centre's and Primary Health Care Clinics within the Gauteng Province, Podiatry once again does not feature. As with the other health care workers mentioned within the document, there is no mention or data regarding Podiatry, the number of posts approved, filled or the number of gaps available to fill. Interestingly, according to the Human Resource Health (HRH) Strategy for South Africa 2012/13 - 2016/17, although not discussed in great detail, Podiatry has been identified as part of the National DoH health workforce model 2011-2025 (South Africa, 2011 (c): 134).

2.2.7. HEALTH CARE UTILIZATION AND HEALTH INEQUALITIES IN SOUTH AFRICA

A study conducted by Harris *et al.* (2011: S102), identified various factors that may have an influence on the utilization of health care services in South Africa. The study highlighted that in order for South Africans and or citizens of other low to middle-income countries to be afforded better access to health care, it is vitally important to understand the factors that may act as barriers to access health care. These authors also found that socio-economic status, race, insurance status and urban-rural location were associated with access to health care in South Africa. Many factors can influence the utilisation of

health care in a country i.e. socio-economic status, physician supply, the countries policies and beliefs, risk behaviours and health status of a population (Morreale, 1998:1).

2.2.7.1. Socio-economic status

Morreale (1998:1) and Lalloo *et al.* (2004: 640), state that socio-economic status of a community may incorporate measures on education, income and demographic characteristics (age, gender and ethnicity). Many studies have been done in South Africa regarding access to health care based on socio-economic status. A recent study has identified that mainly poor, black Africans who are uninsured and living in rural areas experienced the greatest difficulty in accessing health care in South Africa (Harries *et al.*, 2011: S102). The study also found that for outpatient care, while the total utilization of services were similar across socio-economic groups, it was the poorest that utilized mainly primary health care facilities and had a minimum of a primary education or less. It was also found that the richest, usually with tertiary education were more likely to use tertiary hospitals within the public sector and Indian and White insured South Africans were four times more likely to use private-outpatients services. Ataguba *et al.* (2011: 8) identified that the lower socio-economic groups in South Africa have the greatest burden from ill-health and disability and yet have the lowest level of health service utilisation and benefit the least from service use. It emerged in a recent study that health care is inaccessible and unaffordable to travel to facilities mainly for black Africans, poor and rural residents (Harris *et al.*, 2011: S119).

2.2.7.2. Physician supply

Health care utilisation increases with an increase in the number of employed health care providers in a community (Morreale, 1998: 2). According to Harris *et al.* (2011: S116), 37.5 % of outpatients in South Africa were dissatisfied with the time taken to receive services and the long queues, thus leading to a delay in care-seeking.

2.2.7.3. National health policies and values

As cited by Lalloo *et al.* (2004: 641), historically the apartheid government in South Africa denied access to health care to a large portion of the population. The new democratically elected government in 1994 had to develop and implement various programmes that contained within them many policies and values, in order to decrease poverty and inequalities. Within the framework of the Reconstruction and Development Programme, policies were implemented in order to improve health care and access to health care in South Africa (Lalloo *et al.*, 2004: 639). As stated by Morreale (1998: 2), government policies and values can have a direct effect on the health care utilization of a country. However, various studies have still identified major inequalities within health care in South Africa. These authors have stated that more attention needs to be placed on government policies in order to address the social determinants of ill-health, those that bear the greatest burden of ill-health, disease and disability (Harries *et al.*, 2011: S120 and Ataguba *et al.*, 2011: 8).

2.2.7.4. Risk behaviours

According to research, substance abuse (smoking, alcohol, drugs) has many consequences for the individual and for society. The consequences can have detrimental effects on health (chronic disease), crime, injury and behaviour (Kleinert and Horton, 2009: 759; Van Heerden *et al.*, 2009: 358-366). These authors also highlight the importance of the South African government on the further acknowledgment, planning and implementation of policies and legislation regarding substance abuse and health care services.

2.2.7.5. Health status of a population

Health status of a population determines health care utilization, for example studies consistently identified that a lower health status of a population led to an increase utilisation of health care (Morreale, 1998: 2). In South Africa however, the health status of a population versus utilisation is varied predictably by socio-economic status, gender and residence (Harris *et al.*, 2011: S116). This is further alluded to by Coovadia *et al.* (2009:817) that “*The history of South Africa has had a pronounced effect on the health of its people and the health policy and services of the present day*”.

2.2.8. REFERRAL SYSTEMS IN PUBLIC HEALTH CARE IN SOUTH AFRICA

A hierarchical referral system has been established in the South African public health sector where district hospitals play a central role between the primary health care (PHC) clinics, community health centres (CHC) and regional and tertiary hospitals. In and outpatients, with the need for level one services seen at PHC clinics and CHC's, are referred to district hospitals for continuity of care and also to decrease the case loads. However, in South Africa, improper usage of referral systems may be due to factors such as accessibility, acceptability, efficiency and effectiveness (Mojaki *et al.*, 2011: 109). The findings from the study of Harris *et al.* (2011: S117), identifies that the inequities in access to health care in South Africa raises questions regarding referral systems that unfairly privilege certain groups of people within the society. This could hold true in the case of Podiatry, where, due to there being limited structure in place for the profession within the public health sector at any level of care, the small number of Podiatrist within public health care and the improper placing of these Podiatrists within the health care structure, there is no structured referral system to and from Podiatry services within public health care. Mojaki *et al.* (2011: 109), states that there is evidence of ineffective referral systems within the district hospitals and if better care of patients is to be seen, an improvement in the referral systems are mandatory in the areas relating to operating hours, communication

of professionals between health facilities, adequately functioning CHC's, medication supplies, education of patients and professionals.

2.2.9. NON-COMMUNICABLE DISEASES (NCD'S) AND COMMUNICABLE DISEASES

Statistics attributed to the WHO in 2011 was that NCD'S attributed to more than 36 million deaths worldwide, with 80% occurring in the low- to middle- income countries. Nine million deaths affected those aged below 60 years of age. Eighty percent of all NCD's deaths account to diseases such as cardiovascular diseases, cancers, respiratory diseases and diabetes. These diseases shared risk factors such as tobacco use, alcohol abuse, poor diets and physical inactivity. In Africa it is projected that by 2030 the largest contribution of mortality will be due to NCD's, followed by maternal and perinatal deaths (WHO, 2011(a): 1-4).

The WHO (2011(b): 57), categorizes specific causes of death into the following groups:

- Non communicable;
- Communicable;
- Maternal and perinatal conditions; and
- Nutritional deficiencies and injuries.

Communicable diseases worldwide include (WHO, 2011(b): 57),

- Human immunodeficiency Virus (HIV) infections;
- Tuberculosis (TB);
- Malaria;
- Measles; and
- Pneumonia and many others.

The United Nations held a summit on NCD's in September 2011 due to the recognition of the rising threat of NCD's causing preventable and premature deaths in low- to middle-income countries and also due to the fact that NCD's were not addressed in the Millennium Developmental Goals (Bradshaw *et al.*: no date). The Millennium Declaration in September 2000 gave rise to the Millennium Developmental Goals (MDG) and targets, and was signed by 189 countries, including 147 heads of State and Government. The goals and targets were further agreed upon by member states and the global summit in 2005 and a deadline set for 2015.

The purpose for the development of the MDG's and targets according to the United Nations are as follows, "*The goals and targets are interrelated and should be seen as a whole. They represent a partnership between the developed countries and the developing countries to create an environment - at the national and global levels alike - which is conducive to development and the elimination of poverty. The eight Millennium Development Goals (MDGs), which range from halving extreme poverty to halting the spread of HIV/AIDS, to providing universal primary education, form a blueprint agreed to by all the world's countries and all leading development institutions. They have galvanized unprecedented efforts to meet the needs of the world's poorest*" (United Nations (a) and (b), 2005).

As mentioned above there are common risk factors that have been identified around the world that has led to an increase in NCD'S and therefore increased mortality rates. The direct impact that these risk factors have on human physiology and socio-economic status has been explored by the WHO (2011 (a): 1-4). Global statistics have shown that unhealthy behaviours such as smoking (attributed deaths 9%), excessive drinking, poor eating habits and lack of physical exercise (6%) have led to hypertension (13%), obesity (5%), and hyperglycaemia (6%). With regards to the impact on socio-economic status these risk factors hinder progress with regards to the UN Millennium Development Goals. It is said that poverty is directly related to NCD's within a country. An increase in NCD's in a low-income country leads to further poverty and an increase in financial burdens associated with the provision of health care. The poorer get sicker due to limited access to health care and greater exposure to unhealthy behaviours as compared to a person in

a higher social position. In comparison to high income countries, unhealthy behaviours may also be prevalent, however, these groups have better access to health care and products needed (WHO, 2011 (a): 1-4). Prevention campaigns by the WHO have already commenced around the world. The 2008-2013 Action Plan of the Global Strategy for the prevention and control of non-communicable diseases have given countries specific steps on how to address or decrease the identified risk factors associated with NCD's. These steps include implementing anti-tobacco campaigns, diet strategies, physical activity and alcohol abuse, thereby reducing mortality rates (WHO, 2011(a): 1-4).

According to the United Nations Declaration (2000: 7), one of the many goals was meeting the needs of Africa. The declaration states that: *"We will support the consolidation of democracy in Africa and assist Africans in their struggle for lasting peace, poverty eradication and sustainable development, thereby bringing Africa into the mainstream of the world economy"*. With regards to health care they have committed to help with decreasing the spread of the HIV/AIDS pandemic and other infectious diseases.

According to literature stated previously, common communicable and non-communicable diseases are identified globally, specifically in South Africa, and based on the fact that foot and lower limb related complications are associated with diseases such as diabetes, HIV/AIDS, obesity and many more, questions such as the following arise:

- Why does podiatry not feature as a priority service within the South African health care plans?; and
- How much of a role does podiatry play within South African health care?

2.2.10. SOUTH AFRICAN HEALTH STATISTICS

Mayosi *et al.* (2009: 1) identified that since the start of democracy in South Africa there has been major health transitions and a tremendous increase in the burden of communicable, non-communicable, perinatal and maternal, and injury-related disorders/diseases. These authors also identified that the burden of NCD's is not only

limited to rural areas but also the poorer population living in urban areas, resulting in a higher demand for chronic health care. The burden of NCD's is shown by an increase in the number of deaths by diseases such as diabetes, cancer and kidney disease, however, a drop in conditions such as strokes, chronic obstructive airway diseases and lung cancer.

World Health Organization statistics (2011(b):61-67) indicates that globally adult mortality rates had decreased from 1990 to 2008, i.e. there was a decreased probability of dying between the ages of 15 and 60 years old per 1000 population, in both males and females. However, The World Bank Organization (2013: 20) reported that, *“Progress documented in the annual reports of the United Nations Secretary-General has been encouraging: poverty rates have fallen, more children—especially girls—are enrolled in and completing school, and they are—on average—living longer and healthier lives. Fewer mothers die in child birth, and more women have access to reproductive health services. More people now have access to reliable water supplies and basic sanitation facilities”*.

The summary of the Global Health Indicators according to the WHO represents the best estimates based on evidence available in 2010 as opposed to the official estimates of Member States. *“These estimates have been computed using standard categories and methods to enhance cross-national comparability. Therefore, they are not always the same as official national estimates, nor necessarily endorsed by specific Member States”* (WHO: 2011(b): 170).

Global health indicators according to the WHO (2011(b): 1-170) and the World Development Indicators (World Bank Organisation, 2013: 1-145), reported the following:

2.2.10.1. Life Expectancy and Mortality

Although statistics worldwide, including Africa on the whole, have shown a steady increase with regards to life expectancy and a decrease in mortality rates from 1990-2009 (the probability of dying between the ages of 15-60 years of age per 1000 population). In

South Africa however, there appeared to be a dramatic increase in mortality and a steady decrease in life expectancy (WHO, 2011(b): 45-56).

2.2.10.2. Cause Specific Mortality and Morbidity

In 2008, the statistics globally showed that the major cause of death was as a result of non-communicable diseases, followed by communicable disease and injuries. Statistics in 2008 for South Africa and Africa as a continent, demonstrated that the major cause of death was due to communicable diseases, followed by non-communicable diseases and then injury. The specific causes of mortality and morbidity in South Africa and the world included HIV/AIDS, malaria, pneumonia, prematurity, neonatal sepsis, tuberculosis (TB) and measles to name a few. The WHO continues to face a major problem however, mainly in developing countries, in terms of there being limited availability and quality of statistical data collected and provided, including from South Africa (WHO, 2011(b): 57-78).

2.2.10.3. Selected infectious Diseases

Statistics of the WHO highlight show that the most common selected infectious diseases that had affected South Africa in 2009 were TB, cholera, malaria, measles and rubella. There appeared to be no statistics submitted for 2010 or for the selected infectious diseases such as leprosy, meningitis, mumps, poliomyelitis, and H5N1 influenza. Reasons for countries not being able to accurately identify, diagnose and report these infectious diseases is due to the various health care inequalities such as remoteness of communities, lack of facilities and transport and the shortage of health care personnel and laboratory facilities (WHO, 2011(b): 79-90).

2.2.10.4. Health Service Coverage

Statistics indicate that there has been an increase in immunizations for children <1 year of age and that specific infections such as measles have decreased from 1990-2009 in South Africa. However, these infections have increased overall on the African continent as well as worldwide. Antiretroviral therapy coverage in South Africa in pregnant women infected with the HIV is 88% and people with advanced HIV infection 37% in 2009. The case detection rate for all forms of TB in South Africa has increased from 2000-2009, as it has the rest of the world (WHO: 2011(b), 91-102).

2.2.10.5. Risk Factors

Statistics for South Africa show that in 2005 for adults over the age of 20 years, 23.2% males and 42.8% females were found to be obese. Adults 15 years and older consumed seven litres of alcohol per person per year in 2005 and 39% smoked tobacco products in 2006. The prevalence of tobacco smoking amongst adolescent's ages 13 years to 15 years was a staggering 49.4% between the years 2000-2010. There appears to be no information on the comprehensive correct knowledge of HIV/AIDS infections between the ages of 15-24 years (WHO, 2011(b): 103-114).

2.2.10.6. Health Workforce, Infrastructure and Essential Medicines

There are no statistics provided for South Africa in terms of median availability of generic medicines and the number of community health workers per 10 000 population for years 2000-2010. It has been noted by the WHO that low income countries had a much lower health care work force from years 2000-2010 (2011(b): 115-126).

Essack (2012: 830) highlights, within a global context, that a well-functioning health system relies heavily on a skilled competent workforce and subsequently becomes a

crucial entity in achieving the Millennium Development Goals. The author also states *“Sub-Saharan Africa’s health personnel/population ratios are the lowest in the world, and misdistribution between rural and urban areas is marked. Investing in training is thus crucial to address the health workforce crisis in Africa, thereby, increasing life expectancy, decreasing maternal and child mortality rates, combating HIV and AIDS, decreasing the burden of disease from TB and increasing health system effectiveness”*. Within a South African context, Essack further highlights that many models and action programmes have been put into place to ensure economic growth and development between 2010-2014, in priority areas such as education and health. However, as mentioned by Essack, *“Whatever the model, health workforce planning must be inclusive of all health care disciplines, because the disease burden, specifically quadruple burden of disease, necessitates multi-professional health care teams working synergistically to improve health outcomes and life expectancy”* (2012:832).

2.2.10.7. Health Expenditure

The total expenditure on health in South Africa as percentage of Gross Domestic Product (GDP) and the general government expenditure on health as percentage of total government expenditure from years 2000-2008 had marginally decreased. However, per capita total expenditure on health at international dollar rate increased from years 2000-2008 (WHO, 2011(b): 116-126). According to the South African 2013 budget summary (2013 (a): 1), the priority areas for health expenditure are summarized under the following:

- Administration;
- National health insurance;
- Health planning and systems enablement;
- HIV and AIDS;
- TB;
- Maternal and Child Health;
- Primary health care services;

- Hospitals;
- Tertiary health services;
- Human resource development;
- Health regulation; and
- Compliance management.

The audited outcome of health expenditure/spending from 2009-2013 showed a steady increase in areas such as HIV and AIDS, TB, maternal and child health, hospitals, tertiary health services and human resource development (South Africa, 2013 (a): 3).

2.2.10.8. Health Inequities

Incomplete statistics were provided by South Africa regarding the percentage of births attended by skilled personnel, the percentage immunization coverage among 1 year olds and mortality rates in children under the ages of 5 years old. Many countries have submitted incorrect statistics under this category, therefore leading to worldwide statistics as being incomplete (WHO, 2011(b): 127-138).

2.2.10.9. Demographic and Socio-economic Statistics

Demographic and socio-economic factors are major determinants of health in a country. The statistics for South Africa in 2009 showed a population of 50 .11 million, the median age was 25 years old, with an annual growth rate of 1.3% (1999-2009), with an increase in the amount of people living in urban areas from years 1990-2009 (WHO, 2011(b): 139-150). The mid-year estimates in 2013 (South Africa (c), 2013: 2), indicated a population of 52.98 million and an annual growth rate of 0.09% (2012-2013).

During the period 2002-2013 the mid-year provincial estimates shows that Gauteng has the largest population followed by KwaZulu-Natal and Eastern Cape, the smallest

population residing in the Free State and Northern Cape. It was indicated that approximately 29, 17% of the population is younger than 15 years and approximately 7, 8% is 60 years or older (South Africa, 2013 (c): 11).

There was a net primary school enrolment rate of 87% males and 88% females for years 2000-2010, however, an overall decrease in the percentages for years 1990-1999. A major increase was noted in the gross national income per capita for years 1990-2009. The percentage of adult literacy rate had increase from years 1990-2008. The statistics however, still show that the African continent has a staggering 52.3% of the population living on less than US\$1 per day and the lowest gross national income per capita as compared to the rest of the world (WHO, 2011(b): 139-150). The percentage population living on less than US\$1 per day in South Africa between years 2000- 2008 was 26.2%.

2.2.11. THE ROLE OF PODIATRY IN DISEASE MANAGEMENT

The discipline of Podiatry is concerned with the identifying, diagnoses and treatment of disorders, diseases and deformities of the feet and lower limbs. Podiatry is not only concerned with providing timely symptomatic relief but is also responsible for ensuring additional care such as monitoring foot health status, providing health education and acting as gatekeepers to other members of a multidisciplinary team, ultimately leading to an improved quality of life for the patient (Rome *et al.*, 2009:1, 5, 7).

Studies have shown that risk factors such as age, gender, co-morbidities, obesity and socio-economic status have a great impact on foot and lower limb related complications. Prevalence studies have shown that the population groups below 65 years of age are at higher risk of developing foot and lower limb complications, with women being the more likely candidate (Menz, 2008:6). Women are seen to have more complications due to the style of shoes, however, South Africa being a middle to low-income country, and the high prevalence of poverty may lead to a high number of people within the population with poor footwear wearing habits, therefore at risk of developing foot and lower limb

complications. Those partaking in increased physical activity also fall within the high risk category of developing foot and lower limb complications (Menz, 2008:6). This is concerning, as per the UN Millennium Development Goals, efforts are being made in the promotion of increased physical activity, therefore an envisaged increase in foot complications. Menz (2008: 4) discussed studies that have shown that a high number of systemic diseases such as diabetes, obesity and rheumatoid arthritis, to mention a few, have a direct consequence on the vascular, neurological, musculoskeletal and integumentary structures within the foot, leading to foot and lower limb complications such as pain and a decreased QoL.

As mentioned above the complications of communicable and non-communicable diseases is directly interlinked with poverty within a country and therefore leading to further drifting from the envisaged 2015 MDG's. Menz (2008:5) identified several studies that have all agreed that there is a definite link between health status and socio-demographic factors such as income, education and ethnicity. The author however, found disparities between studies, some reporting a link between foot problems and lower levels of education and income, whilst others not. With regards to ethnicity the author reports studies that have found that rather than genetic susceptibility, many health problems, including foot problems, are rather caused by a range of historical, cultural and socio-economic factors that influence lifestyles. However, the influence of ethnicity and foot problems is not well researched.

Mayosi *et al.* (2009: 1) stated that in South Africa *“Concerted effort is needed to strengthen the district-based primary health care system, to integrate the care of chronic diseases and management of risk factors, to develop a national surveillance system, and to apply interventions of proven cost-effectiveness in the primary and secondary prevention of such diseases within populations and health services. We urge the launching of a national initiative to establish sites of service excellence in urban and rural settings throughout South Africa to trial, assess, and implement integrated care interventions for chronic infectious and non-communicable diseases”*.

As stated previously, in terms of the importance of integrated care of chronic diseases and management of risk factors, service excellence, prevention of primary and secondary diseases needed in South Africa and the mention of risk factors in foot and lower limb complications related to various systemic diseases, it may be of great benefit for Podiatry to feature as a priority profession within the health care framework in South Africa, at all levels of care, for the prevention and management of certain diseases/disorders that may lead to preventable and premature deaths in a low- to middle-income country, thereby contributing greatly to the Millennium Developmental Goals for the country by 2015.

2.2.12. INTERNATIONAL STUDIES

A study conducted in Australia by Menz (2009:1-6), stated that chronic diseases in Australia account for an extremely high percentage of disability and decreased QoL. The management of chronic disease had thus led to a monumental effect on the countries health care expenditure so the Australian Government, in 1999, introduced the Enhanced Primary Care (EPC) programme. In 2004, restructuring of the EPC lead to this programme becoming better structured, run by general practitioners (GP) and aimed to improve the coordination of health care for those with chronic disease. The GP's would consult with each patient, draw up a management plan and then refer patients to the necessary allied health professionals for free or at a minimal cost to the patient.

Podiatry in Australia forms part of the allied health services. The Medicare Benefits database for 2004-2008, as cited by Menz (2009:1-6), highlighted that there were a total of 1,338,044 Podiatry consultations and that Podiatrists were the second highest allied health care workers to be seen by the public after physiotherapists. That meant that Podiatry accounted for 34% of all EPC consultations. This figure was phenomenal considering that the amount of Podiatrists in Australia compared to that of other allied health care professionals was considerably smaller. The number of practicing Podiatrists in 2003 was 1,820, compared to 14,300 physiotherapists, 13,939 psychologists and 3,107

occupational therapists. The results of this study highlighted the highest utilization of Podiatry was by the elderly (75%). Elderly females showed a higher risk than males of developing foot complications and suffering with chronic systemic diseases for example; obesity, osteoarthritis, hypertension, osteoporosis, cardiovascular disease and Diabetes. It was also interesting to note that out of the 1, 820 practicing Podiatrist in Australia, 75% were based within the private sector.

A clinical audit of foot problems in patients suffering with rheumatoid arthritis (RA) was carried out in Auckland, New Zealand (Rome *et al.*; 2009:1-7). One hundred RA patients were recruited to partake in the study. The results of this study highlighted that over 85% of patients with RA suffered from various forms of foot pathology and 24% reported being seen by a Podiatrist, however, not one patient from this study reports having any podiatric intervention with regards to the overall management of this disease. This audit demonstrated that RA patients felt podiatric intervention necessary as long term disability is prevalent in the majority of patients with this disease. The results also suggested that in order to identify patients with foot problems, health care practitioners should make a concerted effort to question patients about their feet, and should foot problems be identified, the patients should be immediately referred to a Podiatrist.

A clinical audit of core Podiatry treatment in the National Health Service (NHS) conducted in the United Kingdom (Farndon *et al.*; 2009:1-6), aimed to provide data that would assist in providing evidence towards standards and outcomes of podiatric practice. The audit provided 1, 047 patients with self-administered foot health status questionnaires (pre and 2 weeks post treatment) and a section where the Podiatrist rated the patients' foot health based on their podiatric diagnosis. The results showed that 75% of patients had slight or moderate foot problems, with a mean age of 72.9 years and majority females. The pre and post treatment scores showed that the majority of patients' original foot problem remained the same or got better. The Social Care Information Center, as cited by Farndon *et al.* (2009:1-6), released statistics from 2004-2005 for the NHS chiropody services that identified that a high incidence of foot problems are reflected in the number of patients

accessing podiatric care, and have indicated that a massive 2 million people are treated every year within the NHS, majority being the elderly and approximately 769,000 were new patients.

2.3. CONCLUSION

It is evident from the literature that Podiatry in South Africa has challenges placing itself within the National Health framework of the country. Regardless of an increase in the number of new posts created in public health care in the past year, there still seems to be limited or insufficient structures in place for Podiatry within the public sector at any level of care. The literature review has also highlighted the inequalities and utilization of health care in South Africa and thereby the importance of understanding these factors in order to improve health care in the country. Studies conducted abroad prove that clinical audits are vitally important and necessary in order to provide data that will provide evidence highlighting the need for podiatric intervention and a permanent structured placement within the National Health framework of South Africa in order to prevent foot disabilities and a decline in QoL.

This Chapter also discussed common communicable and non-communicable diseases worldwide and in South Africa and most importantly the risk factors leading to mortality and the prevention efforts put in place by the United Nations. South Africa, being a multicultural society with many ethnic groupings, with various income-based classes, a wide variety of age groupings and education levels, is in need of podiatric research that will increase the knowledge base regarding risk factors for foot and lower limb complications in developing countries, therefore contributing to the world wide podiatric knowledge that will lead to the recognition of Podiatry as an essential health care service within the country and ultimately assisting with improving podiatric care and foot HRQoL.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1. INTRODUCTION

In order for there to be adequate patient care, a specific set of skills needs to be adopted. The practice of these specific skills are justified by a systematic and shared amount of professional knowledge, however, obtaining this systematic knowledge requires the usage of appropriate methodologies (Polgar and Thomas, 1995: 3). The following Chapter discusses the design and various methodological processes that were adopted in this research dissertation.

3.2. THE RESEARCH STRATEGY AND APPROACH

3.2.1. THE RESEARCH PARADIGM: QUANTITATIVE RESEARCH

Porter and Carter as cited by Offredy and Vickers (2010: 80-81), state "*Quantitative research is a formal, objective, systematic process for obtaining quantifiable information about the world, presented in numerical form and analyzed through the use of statistics*".

Quantitative research allows for theories to be tested, relationships to be identified or correlations to be determined between predefined variables and to establish facts (Cottrel and Mckenzie, 2005:4). There are many paradigms within quantitative research namely experimental research, quasi-experimental research, non-experimental research (including descriptive and correlation research), survey research and evaluation research (Cottrel and Mckenzie, 2005: 6 and Offredy and Vickers, 2010: 81). The use of quantitative experimental research examines the cause-and-effect relationships, for example, obesity related to Type 2 Diabetes (Offredy and Vickers, 2010: 81). Non-experimental research does not examine cause-

and-effect relationships but rather is designed to describe research numerically (Cottrell and Mckenzie, 2011: 7).

3.2.2. TYPES OF QUANTITATIVE RESEARCH

3.2.2.1. The Prospective Research Design

Cohort, prospective or longitudinal studies are interchangeable terms that refer to the process whereby cohorts of subjects are recruited at a specific time and prospectively followed in order to measure their health outcomes. It can be used to accurately identify risk factors, estimate incidence rates or to gather information that describes the natural history or prognosis of a disease and is said to be one of the most appropriate designs to test relationships or patterns between phenomena (Peat *et al.*, 2002: 40). These authors also describe prospective data as data that has been collected as the study progresses of the subjects' current health status or exposures.

3.2.2.2. Non-experimental Research Design

These studies are mainly used in descriptive or correlation type research (Maree *et al.*, 2010:152). These authors state that in non-experimental research designs, there is no manipulation of independent variables and that control and randomization are not possible or relevant. Maree *et al.* (2010:152) and Cottrell and Mckenzie (2005:7) state that surveys are most commonly used within this research design in order to collect quantitative data that can be descriptive or exploratory.

3.2.2.2.1. Descriptive Research

Descriptive research describes the information or knowledge that exists already, but may also identify new information, facts or meanings that have not been discovered as yet. This involves observation, description and documentation of information gathered from individuals, groups or situations by means of closed ended questions using questionnaires or interview (Offredy and Vickers, 2010:83).

3.2.2.2.2. Correlation Research

Within the paradigm of a quantitative study, correlation research refers to a systematic identification and description of the nature of relationships between two or more variables that have been identified within a study (Offredy and Vickers, 2010: 83 and Cottrel and Mckenzie, 1995:7).

3.3. DATA COLLECTION INSTRUMENT

Many techniques may be employed in order to collect data in a quantitative research study and represented numerically as opposed to in words. The various techniques may be in the form of a questionnaire, interview, by observation, scales and physiological measurements (Offredy and Vickers, 2010:84). The data collection instrument measures predefined variables and must take into consideration what type of data will be generated, to allow the data collected to be quantifiable and statistical (Cottrel and Mckenzie, 2005:140).

McMillan and Schumacher and Crowther *et al.* as cited by Maree *et al.* (2010:9) state *"In survey research, researchers select samples of respondents before administering questionnaires or conducting interviews to collect information about their attitudes, values, habits, ideas, demographics, feelings, opinions, perceptions, plans and beliefs"*.

Maree *et al.* (2010:9) states that the use of surveys are typical where the samples sizes are usually large and when there are many variables or hypothesis being tested. This study employed the use of a questionnaire.

3.3.1. THE QUESTIONNAIRE

The Foot Health Status Questionnaire is a specifically designed tool to measure foot HRQoL (Bennett and Patterson, 1998: 87-92). The authors designed this questionnaire to specifically measure the foot health status of a patient with the intention of being able to determine whether the care that podiatrist's provide meet professional standards.

3.3.1.1. Questionnaire: Section A: The Foot Health Status Questionnaire (FHSQ)

As mentioned previously, data was collected using a validated Foot Health status questionnaire (Section A). Bennett and Patterson (1998:87) state that in order to measure foot HRQoL, a new instrument needed to be developed. The FHSQ, through rigorous validation processes, was developed to assist researchers and clinicians identify the changes in foot health status due to surgical or therapeutic interventions. These authors also mention that this instrument has the advantage of improving response rates due the fact that it is a self-administered tool and will work best as a postal survey i.e. foot health status before and after treatment. However in South Africa, due to the anticipated language barriers, patient difficulty in accessing postal services and cost implications for the patient, it was deemed necessary for the podiatrist at the various healthcare facilities to complete the questionnaire with the patient in order to reduce respondent burden. This study also only determined foot health status/foot health related quality of life in patients at the time of consultation.

Section A of the questionnaire is divided into three sub-categories. Sub-category 1 has 13 questions which are divided into four domains i.e. foot pain, foot function,

general foot health and footwear. Each of these represent unique but related dimensions of foot health. Sub-category 2 has 20 questions which capture generic measures of health and has questions closely similar to that of the well-known quality of life questionnaire (Short Form 36). Sub-category 3 requires information from the participant relating to standard demographic data and variables such as socio-economic status, co-morbidities and service utilisation.

For the purposes of this study Question 25 was modified during data collection, as South African citizens are not seen as health care cardholders. The participant was, in this case, simply asked if he/she was a pensioner.

3.3.1.2. Questionnaire: Section B

Section B of the questionnaire being specifically structured and pre-tested for the purposes of this study gathered further information relating to the aims and objectives of this study, to ensure reliability and consistency. This section of the questionnaire collects data relating to podiatric intervention, number of consultations had by participants at the Podiatry departments, podiatric diagnoses, podiatric management, referral pathways and reasons for referrals.

3.3.2. THE PILOT STUDY

The purpose of a pilot study within a quantitative paradigm is to test whether there was a correct interpretation of questions within the questionnaire, whether the questions asked within the questionnaire would answer all the research questions, and to ensure that the chosen methodology or samples are appropriate. The feedback from a pilot study offers the researcher the opportunity to amend or adjust any errors or misinterpretations regarding the research tool (Offredy and Vickers, 2010:85 and Maree *et al*, 2010: 155). Therefore, for the purposes of this study a total of ten patients,

whose data was not utilized for the final analysis, had been recruited for the pilot study in order to ensure validity and reliability.

Section A (FHSQ) is a validated questionnaire, however, the researcher felt that in a country where there are nine official languages, a pilot study was necessary to ensure that the questions were correctly interpreted and that the research questions adequately met. Section B of the questionnaire required validation as the questionnaire had not been used before.

3.4. DATA ANALYSIS

3.4.1. INTRODUCTION

According to Offredy and Vickers (2010: 178), data collection and analysis, when undertaking quantitative research, involves the collection of numerical data that answers the research aims and objectives and gives meaning to the information collected.

Data analysis in a quantitative research study involves the use of the following procedures and techniques determined by the research methodology, aims and objectives of the study and research instruments used (Offredy and Vickers, 2010:179):

- The study variables are described using descriptive and exploratory procedures;
- Relationships are tested using statistical techniques; and
- Using techniques to make predications and examine cause and effect.

3.4.2. ANALYSES

The overall foot health status i.e. foot HRQoL life for each patient was determined. Data was analysed using frequencies and descriptives. Reliabilities were tested for consistency using the Chronbach's Alpha test. Tests for normality were done depending on the group sizes. The test for groups over 50 was the Kolmogorov-Smirnov test and groups below 50 was the Shapiro-Wilk test. Comparisons between groups were made using t-tests. Comparisons for two or more groups used the Independent Samples t-test (normality) and The Mann-Whitney test (non-normality). Comparisons for three groups or mores used the Oneway-ANOVA test (normality) and The Kruskal-Wallis test (non-normality).

3.4.3. PROCEDURE

Once data collection had been completed, the information gathered was organised and emerging trends were highlighted. All questionnaires were coded and sent to Statkon (statistical analysis department at the University of Johannesburg), for analysis using the following procedures/tests:

3.4.3.1. Frequencies, distributions and descriptive statistics

Descriptive data/statistics are represented numerically within tables and graphs and involves the calculation of percentages, averages, the measuring of variability or variations of data and also the correlation of variables in order to give meaning and insight into the information acquired (Offredy and Vickers, 2010: 181).

Frequency distribution is one of the most common methods used to organize data in a table or on a graph, representing the number within a category on a measurement scale (Manikandan, 2011:54-56). This author also states that frequency distribution

“allows the researcher to have a glance at the entire data conveniently and shows whether the observations are high or low and also whether they are concentrated in one area or spread out across the entire scale”.

There are many ways by which frequency distributions of quantitative data may be displayed graphically i.e. histograms, the frequency polygon and the box and whisker plot displays (Maree *et al.*, 2010:191 and Manikandan, 2011:54-56). Frequency tables, according to Manikandan (2011:54-56), show various measurement categories and the number of observations within each category.

3.4.3.2. Internal Reliability: Chronbach's Alpha Co-efficient

This test is used to measure the internal reliability of the research instrument and is based on the “*inter-item correlations*”. In other words internal reliability provides an estimation of the consistency or similarity of responses of items within the research instrument (Maree *et al.*, 2010:216), in this study for each score question within the questionnaire. If the items are strongly correlated with each other the alpha coefficient will measure closer to one and this means that there is internal consistency and therefore a high reliability. The opposite effect if the items are poorly correlated, where the alpha coefficient will measure closer to zero (Maree *et al.*, 2010:216).

3.4.3.3. Normality: Kolmogorov-Smirnov test and the Shapiro-Wilk test

Ahad *et al.* (2011:637) states that all statistical data needs to be “*approximately normal or normally distributed*”, where Rumsey (2003:49) states that the bell-shaped curve is a common type of data distribution.

Maree *et al.* (2010:198) states that statistical inference is a field of statistics that relies greatly on the probability theory (quantifying the likelihood or the frequency of an event to occur). The normal distribution is an important probability distribution in statistics. As stated by Rumsey (2003:49) the organization and grouping of numerical data, from smallest to largest and broken into reasonably sized groups can then be represented on graphs in order to analyse the shape and distribution of the data.

The tests employed in this study to check for normality were the Kolmogorov-Smirnov test (dataset more than 50) and the Shapiro-Wilk test (data set less than 50).

3.4.3.4. Analysis of means: The Independent samples t-test

Maree *et al.* (2010:225) highlights that the t-test technique may be used to calculate an average of two quantitative variables in a single sample or when there is a comparison of a quantitative variable and a specified constant value in a single sample. According to Offredy and Vickers (2010:194), the use of a t-test can determine whether there is a statistical difference between the means of two groups. The Independent Samples t-test was employed by this study in order to identify the means of two independent groups where it is known that the variables had a normal distribution (Maree *et al.*, 2010:226).

3.4.3.5. Mann-Whitney Test

Maree *et al.* (2010:133), states that this test is the equivalent to the independent samples t-test however, it is non-parametric meaning that there may be non-normality of data. This test was employed in this study when it could not be assumed that the study variable was normally distributed in the populations.

3.4.3.6. Analysis of Variance: Oneway-Anova Test

The Anova test, as described by Maree *et al.* (2010: 229-230) and Offredy and Vickers (2010:194), is the comparison of the relationships and differences of more than two independent groups on a single quantitative variable, that has a normal distribution within a population and also the variance of the variables is identical in all populations. The One-Way Anova test was chosen in this study as it produced a one-way analysis

of the variance for quantitative dependent variables as compared to independent variables.

3.5. CONCLUSION

The methodological approach as discussed above was used in this study to investigate the following:

- The patient's foot HRQoL within four domains namely;
 - Foot pain;
 - Foot function;
 - Footwear; and
 - General foot health;
- The generic measures of the patient's health:
 - Standard demographic data and variables such as gender, age, socio-economic status, co-morbidities and service utilization;
 - The foot health status of new patients to follow up patients;
 - The patient's podiatric diagnosis and management/treatment at the time of current consultation;
 - The patient's pathway of referral to and from Podiatry and the reasons thereof; and
 - An overall link or co-dependency between foot HRQoL, demographics, clinical characteristics and referral pathways.

CHAPTER 4: RESULTS

4.1. INTRODUCTION

The following Chapter represents the results of this study. The results has been represented in the form of tables, graphs and pie charts.

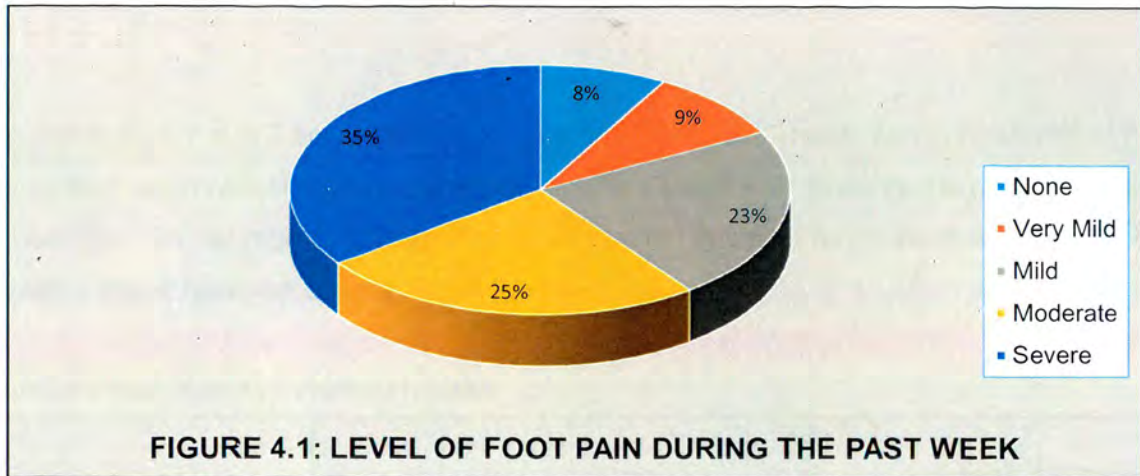
Section A of the questionnaire is divided into three sub-categories. Sub-category 1 has 13 questions which are divided into four domains i.e. foot pain, foot function, general foot health and footwear. Each of these represent unique but related dimensions of foot health. Sub-category 2 has 20 questions which capture generic measures of health and has questions closely similar to that of the well-known quality of life questionnaire (Short Form 36). Sub-category 3 requires information from the participant relating to standard demographic data and variables such as socio-economic status, co-morbidities and service utilisation. Section B of the questionnaire collects data relating to podiatric intervention, number of consultations had by participants at the Podiatry Departments, podiatric diagnoses, podiatric management, referral pathways and reasons for referrals.

4.2. RESULTS: DESCRIPTIVES AND FREQUENCIES

4.2.1. SECTION A: SUB-CATERGORY 1: FOOT HEALTH

4.2.1.1. Foot pain

Question 1, 2, 3 and 4 are under the domain 'foot pain". These questions identify the severity, type and frequency of foot pain. Question 1 indicated the level of foot pain participants had experienced during the past week. Figure 4.1 highlights the responses to this question. The average pain levels amongst all participants (n=231) during the past week ranged between mild and moderate pain.



Question 2, 3 and 4 indicated the type and frequency of foot pain participants had experienced during the last week. The results of these questions are highlighted in Table 4.1 below. On average, the type and frequency of foot pain experienced by participants' during the last week ranged between 'fairly many times' and 'very often'.

Table 4.1 Type and frequency of foot pain in the last week

		Never	Occasionally	Fairly Many Times	Very Often	Always	Total
Q2. How often have you had foot pain?	Number	17	55	28	54	77	231
	%	7.4%	23.8%	12.1%	23.4%	33.3%	100.0%
Q3. How often did your feet ache?	Number	33	67	22	52	56	230
	%	14.3%	29.1%	9.6%	22.6%	24.3%	100.0%
Q4. How often did you get sharp pains in your feet?	Number	42	68	37	44	38	229
	%	18.3%	29.7%	16.2%	19.2%	16.6%	100.0%

4.2.1.2. Foot function

Question 5, 6, 7 and 8 are under the domain “foot function”. These questions identified foot impact on the physical functioning of participants’. Table 4.2 highlights the results of these questions. On average foot impact on participants’ physical functioning during the past week, ranged between slightly and moderately.

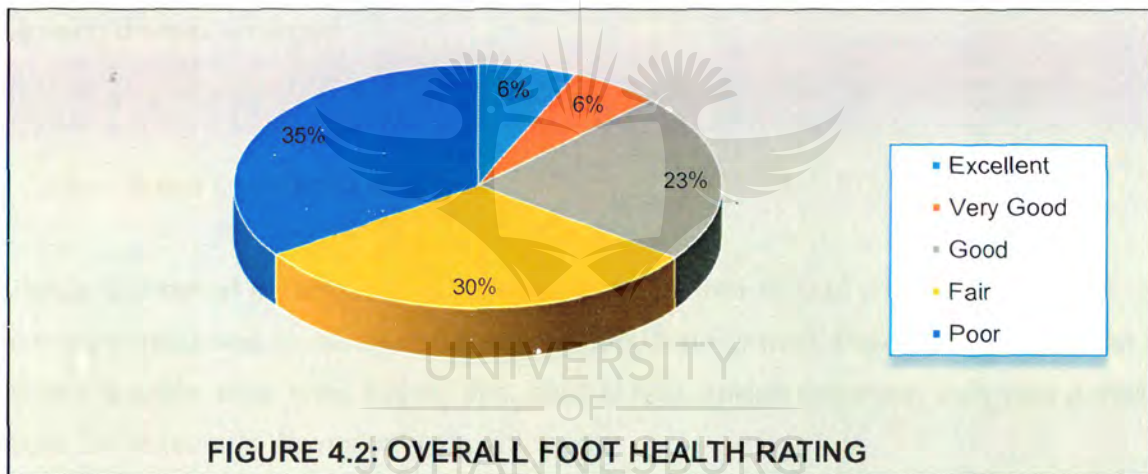
Table 4.2 Foot impact on physical function

		Not at all	Slightly	Moderately	Quite a bit	Extremely	Total
Q5. Have your feet caused you to have difficulties in your work or activities?	Number	48	53	38	46	45	230
	%	20.9%	23.0%	16.5%	20.0%	19.6%	100.0%
Q6. Were you limited in the kind of work you could do because of your feet?	Number	59	41	44	45	41	230
	%	25.7%	17.8%	19.1%	19.6%	17.8%	100.0%
Q7. How much does your foot health limit you walking?	Number	54	47	52	55	23	231
	%	23.4%	20.3%	22.5%	23.8%	10.0%	100.0%
Q8. How much does your foot health limit you climbing stairs?	Number	66	42	35	46	41	230
	%	28.7%	18.3%	15.2%	20.0%	17.8%	100.0%

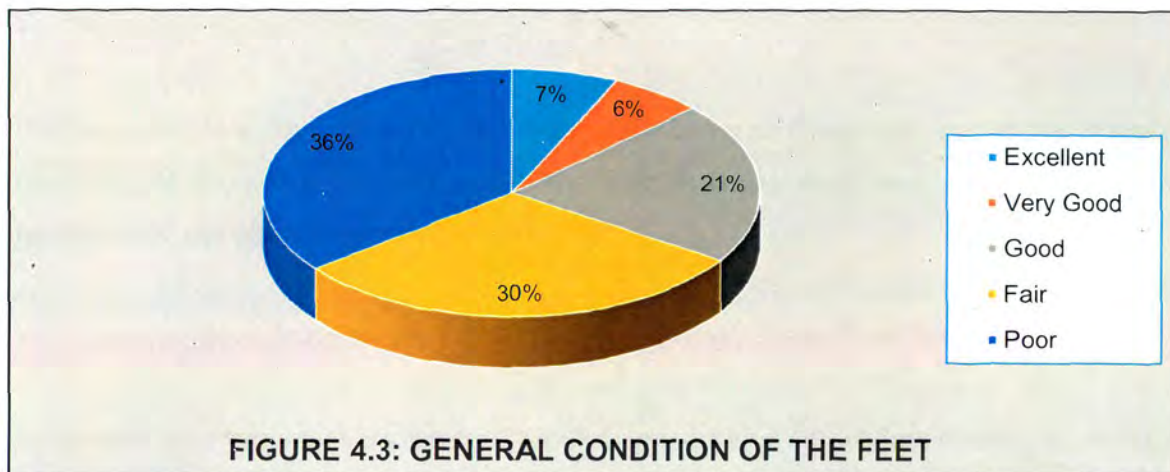
4.2.1.3. General foot health

Question 9 and 13 are under the domain “general foot health”. These questions identify participants’ self-perception of the general health of their feet. Participants were also asked to provide comments regarding the current state of their feet.

Question 9 identified how participants’ had rated their overall foot health. Figure 4.2 highlights the results of this question. On average participants’ rated their overall foot health between good and fair.



Question 13 identified the general condition of participant’s feet. Figure 4.3 depicts the results of this question. The average self-perceived general condition of participants’ feet ranged between fair and good.



Question 13a allowed participants to comment about the current state of their feet. The following themes emerged:

- Pain related comments

A large number of participant's comments were centred around pain. Comments about pain were described as generalized, severe, moderate or mild. Patients indicated pain in either the heels, toes, legs, knees, feet, balls of feet, ankles or calves. Pain was a major cause for concern in the majority of participants.

- Dermatology related comments

A large number of participant's comments were centred around concerns or complaints relating to possible dermatologically related conditions of the feet, such as painful corns or calluses, plantar warts, blisters, cracked heels, discoloured skin, previous melanoma, fungus, itchy skin, smelly feet, sweaty feet and growths on the feet. Nail problems, such as ingrowing toenails, discoloured toenails, thickened toenails, post nail surgery redressing, ulcers, previous ulcerations and new wounds were also prevalent.

- Neurology related comments

Participant's comments were centred around concerns or complaints relating to possible neurological conditions or disorders of the feet, such as numbness, burning, pins and needles and peripheral neuropathy of the feet.

- Vascular related comments

Participant's comments were centred around concerns or complaints relating to possible vascular conditions or disorders of the feet, such as, cold feet, varicose veins, previous Deep Vein Thrombosis, leg cramps and wearing compression stockings.

- Musculoskeletal related comments

Participant's comments were centred on concerns or complaints relating to possible musculoskeletal disorders or structural deformities, such as flat feet, swollen feet, bunions, hammer toes, overlapping toes, deformed feet, ligament tears, feet being different from each other, previous bunionectomy, previous amputations, stiffness of the feet, limping whilst walking, osteoarthritis and rheumatoid arthritis.

- Trauma related comments

Participant's comments were centred around trauma that had occurred to the feet, such as a laceration to the foot, stubbing of the toe and motor vehicle accident causing trauma to the feet.

- Comments related to difficulties experienced

Participant's comments were also centred on the difficulties experienced due to their feet. The difficulties identified were that the pain in the feet had affected the participant's activities of daily living. Difficulties experienced during standing, walking, climbing stairs,

walking barefoot, wearing shoes, cutting toenails, doing housework, gardening, shopping and sleeping. Some participants also felt that their feet were in a fair or poor condition.

- Comments related to improvement of symptoms

Some participant's comments were centred on the improvement of foot symptoms due to regular podiatric management. Participants reported an increase in pain relief due to podiatric foot devices, regular treatment and prescribed medication. Some participants reported that their feet are in good condition.

4.2.1.4. Footwear

Question 10, 11 and 12 are under the domain "footwear". These questions identified participants' opinion on the difficulties and limitations they've experienced with regards to footwear. The results of these questions are highlighted in Figure 4.4. On average it was found that participants 'agreed' that it was difficult finding shoes that did not hurt their feet, it was difficult finding shoes that fit their feet and that they were limited in the number of shoes that they could wear.

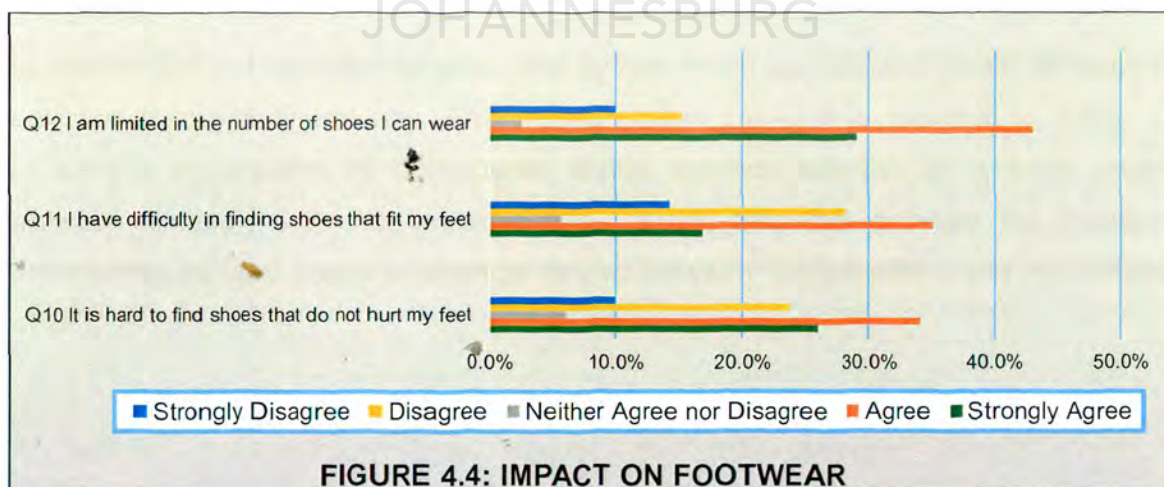


FIGURE 4.4: IMPACT ON FOOTWEAR

4.2.2. SECTION A: SUB-CATEGORY 2: GENERIC HEALTH MEASURES

As mentioned above this sub-category two has 20 questions which capture generic measures of health and has questions closely similar to that of the well-known quality of life questionnaire (Short Form 36).

Question 14 allowed participants to rate their general health. Figure 4.5 highlights the results of this question. On average participants (n=229) rated their general health as “fair”.

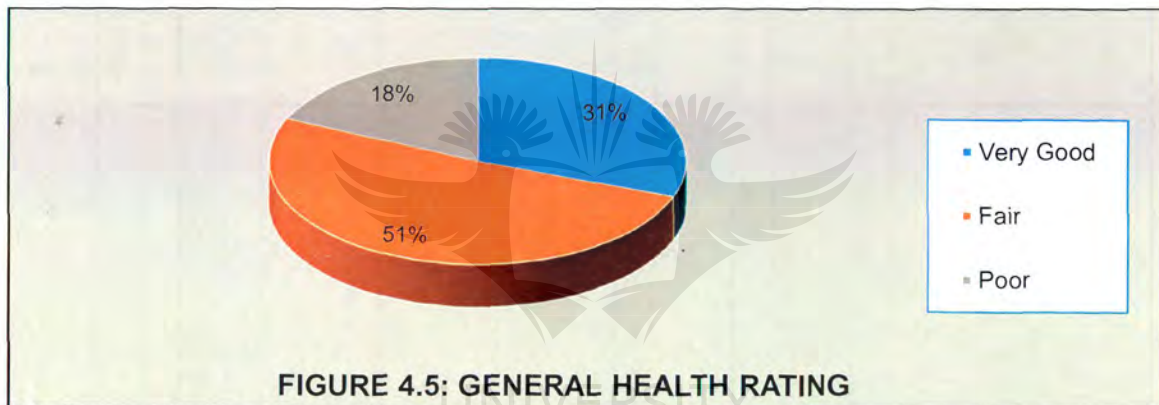


FIGURE 4.5: GENERAL HEALTH RATING

Question 15 A to I identified whether, and by how much, participants' health limited their activities during a typical day. The results of this question is depicted in Table 4.3 Limitations experienced by participants' during vigorous activities on average ranged between "limited a lot" and "limited a little". During moderate activities the limitations experienced by participants on average ranged between "limited a little" and "no limitation at all".

Table 4.3 Limitations of daily activities

		Yes, Limited a Lot	Yes, Limited a Little	No, Not Limited At All	Total
A. Vigorous activities, such as running, lifting heavy objects, or (if you wanted to) your ability to participate in strenuous sports	Number	88	86	54	228
	%	38.6%	37.7%	23.7%	100.0%
B. Moderate activities, such as cleaning the house, lifting a chair, playing golf or swimming	Number	39	73	117	229
	%	17.0%	31.9%	51.1%	100.0%
C. Lifting or carrying bags of shopping	Number	39	54	136	229
	%	17.0%	23.6%	59.4%	100.0%
D. Climbing a steep hill	Number	49	87	93	229
	%	21.4%	38.0%	40.6%	100.0%
E. Climbing one flight of stairs	Number	40	70	119	229
	%	17.5%	30.6%	52.0%	100.0%
F. Getting up from a sitting position	Number	33	60	136	229
	%	14.4%	26.2%	59.4%	100.0%
G. Walking more than a kilometre	Number	53	75	101	229
	%	23.1%	32.8%	44.1%	100.0%
H. Walking one hundred meters	Number	23	52	154	229
	%	10.0%	22.7%	67.2%	100.0%
I. Showering or dressing yourself	Number	6	15	208	229
	%	2.6%	6.6%	90.8%	100.0%

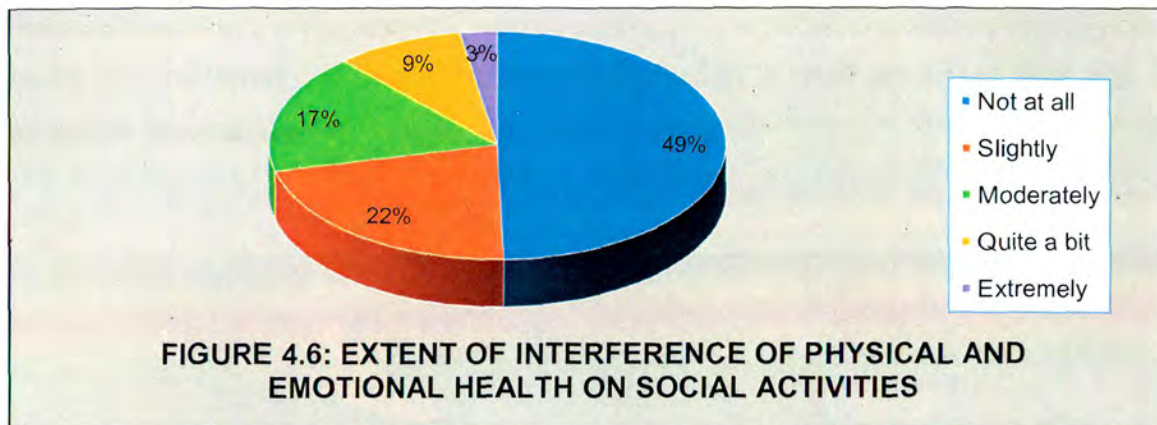
These specific activities caused some limitations in the majority of the participants:

- Climbing a steep hill (59.4% some limitation and 40.6% no limitation at all); and
- Walking more than one kilometre (55.9% some limitation and 44.1% no limitation at all).

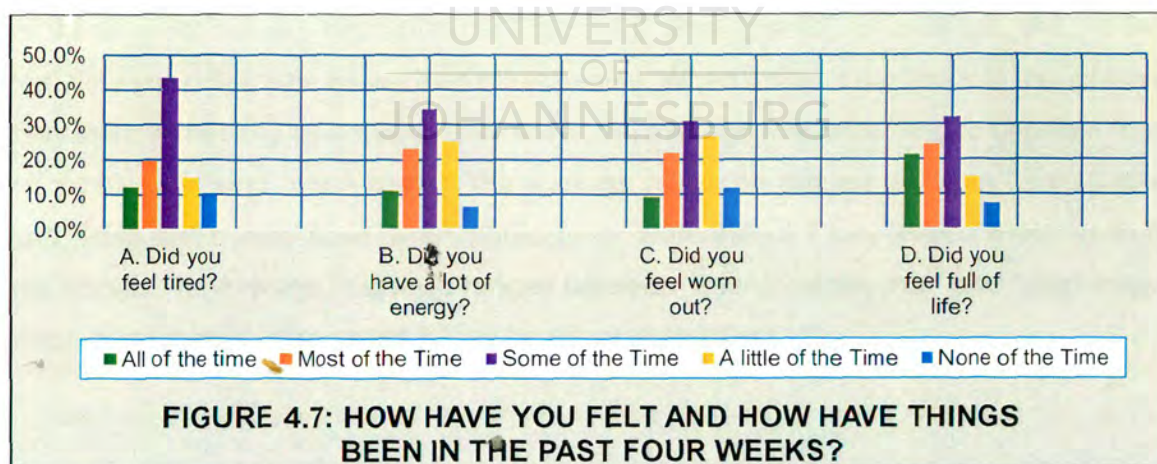
These specific activities caused no limitations in the majority of the participants:

- Lifting or carrying bags of shopping (40.6% some limitation and 59.4% no limitation at all);
- Climbing one flight of stairs (48.1% some limitation and 51.9% no limitation at all);
- Getting up from a sitting position (40.6% some limitation and 59.4% no limitation at all);
- Walking 100 meters (33.2% some limitation and 67.3% no limitation at all); and
- Showering or dressing yourself (9.2% some limitation and 90.8% no limitation at all).

Question 16 explored to what extent participants physical health or emotional problems interfered with their normal social activities with family, friends, neighbours or social groups. Results are depicted in Figure 4.6. Results have indicated that participants (n=230) physical health or emotional problems interfered with their normal social activities, on average between “not at all” and “slightly”.

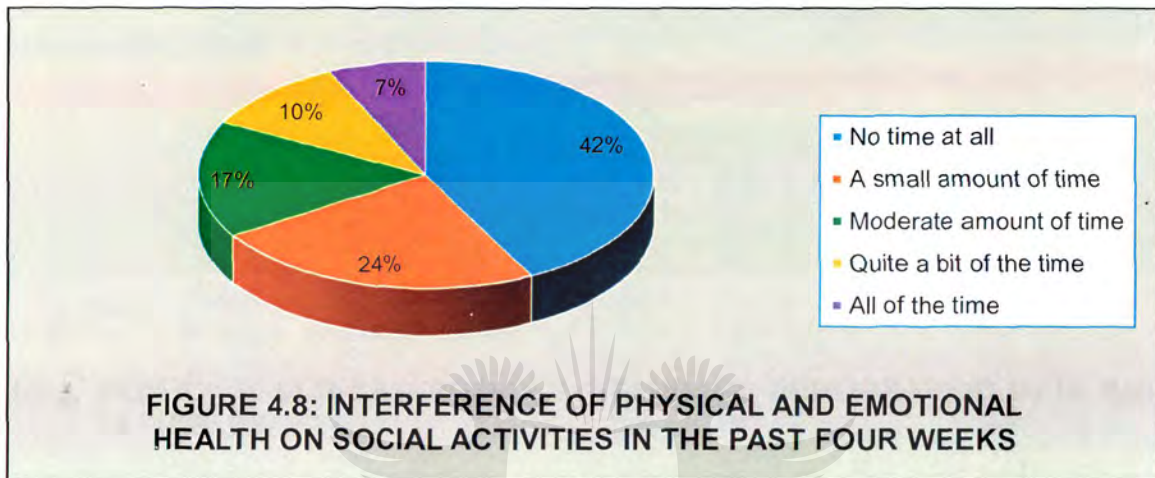


Question 17 A to D indicated how participants had felt and how had things been for them during the past four weeks. For each answer participants had to indicate how much of the time they had felt that way in the past 4 weeks. Results are illustrated in Figure 4.7 and in general participants' felt tired, had a lot of energy, felt worn out and felt full of life only "some of the time".



Question 18 identified how often, in the past four weeks, the participants' emotional problems and physical health interfered with their social activities, like visiting with friends and relatives. Figure 4.8 highlights the results of this question. On average the results

have indicated that, in the past four weeks, participants' emotional problems and physical health had interfered with their social activities between "a small amount of time" and "a moderate amount of time".



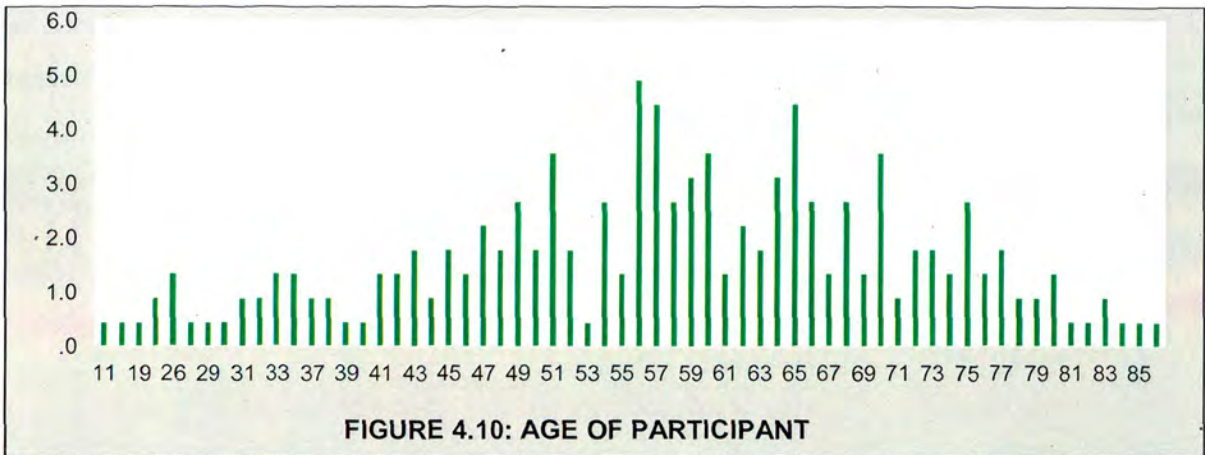
Question 19 A to D explored general questions regarding participant's health. The results of these questions are highlighted in Figure 4.9. Participants', on average, did not feel that they got sick a little easier than other people. When asked if participants thought that they were as healthy as anybody they knew, the average response ranged between "true or mostly true" and "don't know". The average response ranged between "don't know" and "false and mostly false" when participants' were asked if they expect their health to get worse. The average response ranged between "true or mostly true" and "don't know" when participants' were asked if their health was excellent.



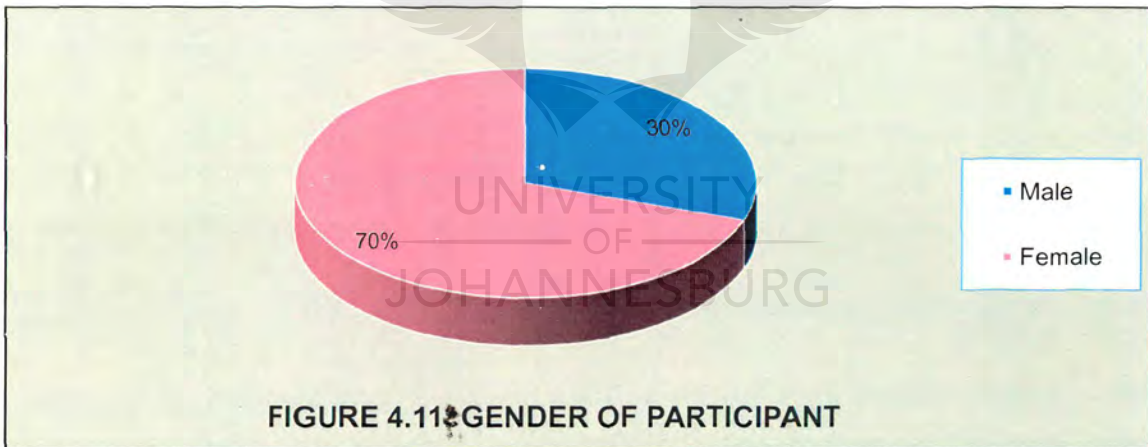
4.2.3. SECTION A: SUB-CATEGORY 3: STANDARD DEMOGRAPHIC DATA AND VARIABLES

As mentioned previously, sub-category 3 has approximately 10 questions which has collected from participant's standard demographic data and variable such as socio-economic status, co-morbidities and service utilisation. All participants were given the assurance of anonymity, therefore, questions 20 and 21 will not be represented in this Chapter as it relates to the patients personal information such as names and addresses. Question 23 will not be represented in this Chapter as it relates to the date that the questionnaire was completed by the participant.

Question 22.1 indicated participants' ages. The average age of the total number of participants (n=224) was 57.31 years old. The youngest age recorded was 11 years old and the oldest was 91 years old.



Question 22.2 indicated the gender of the participants. Figure 4.11 highlights that 69.8% of participants were females and 30.2% males (n=231).



Question 24 explored whether participants are currently taking any medicine/s prescribed by their doctor for specific conditions. Figure 4.12 highlights the various conditions participants have been prescribed medications for. This question contained multiple responses therefore results are represented as percentage of cases per condition. Figure 4.12 also highlights a combination of conditions that were provided as options in the questionnaire, as well as conditions listed by participants under the “other” option. Results

of conditions that were provided as options in the questionnaire had 387 responses and results of conditions listed in the “other” option had 75 responses.

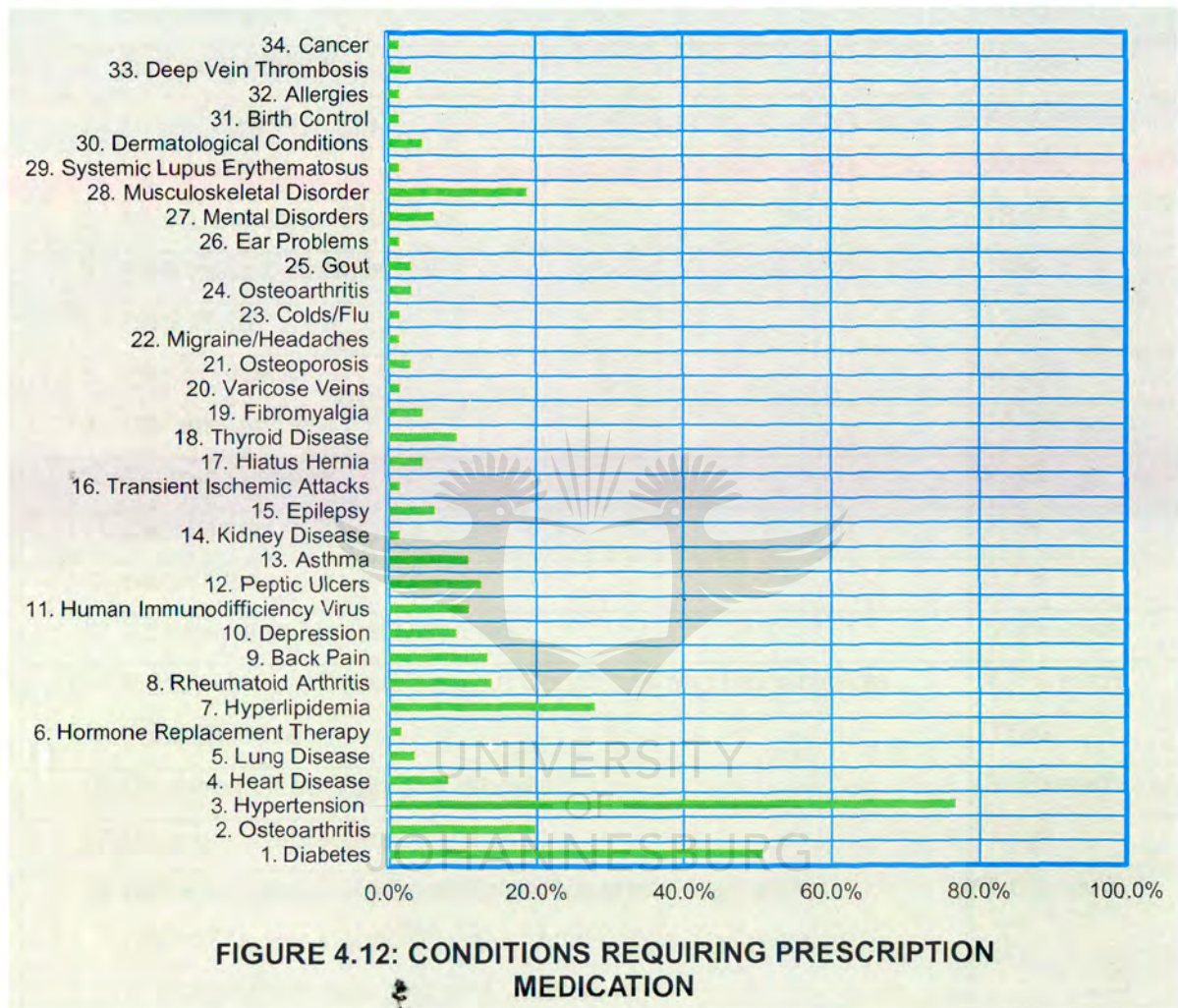


Table 4.4 provides a summary of the various conditions that participants were taking prescription medication for, in the order of highest to lowest percentage of cases.

Table 4.4 Condition as Percentage of cases

CONDITION	% OF CASES
1. Hypertension	76.7%
2. Diabetes Mellitus	50.6%
3. Hyperlipidemia	27.9%
4. Osteoarthritis	22.9%
5. Musculoskeletal Disorders	18.8%
6. Rheumatoid Arthritis	14%
7. Back Pain	13.4%
8. Peptic Ulcers	12.5%
9. HIV and Asthma	10.9% each
10. Thyroid Disease	9.4%
11. Depression	11%
12. Heart Disease	9.7%
13. Epilepsy and Mental Disorders	6.3% each
14. Hiatus Hernia, Dermatological Conditions and Fibromyalgia	4.7% each
15. Lung Disease	3.5%
16. Gout and Deep Vein Thrombosis	3.1% each
17. Hormone Replacement Therapy	1.7%
18. Kidney Disease, Varicose Veins, Migraine/Headaches, Colds/Flu, Ear Conditions, Systemic Lupus Erythematosus, Contraception, Allergies and Cancer	1.6% each

Question 25-29 explored socio-economic determinants. Table 4.5 highlights the results of these questions.

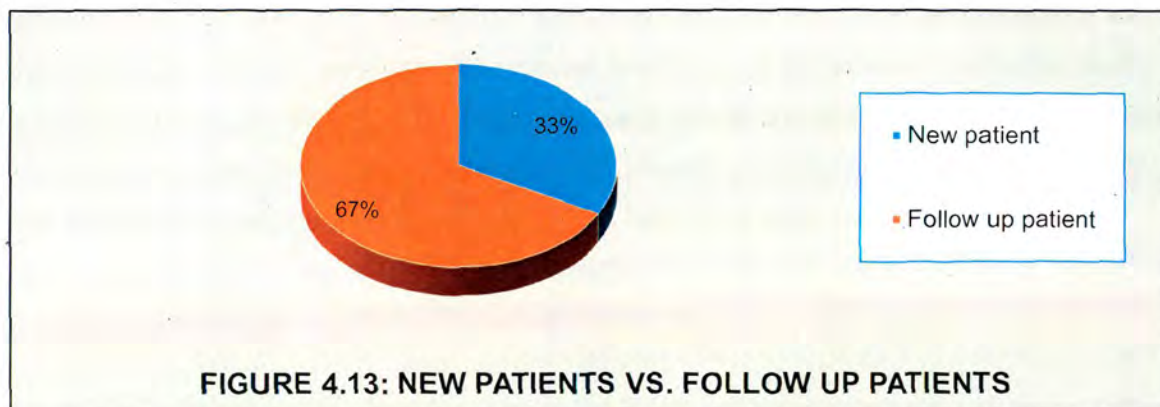
Table 4.5 Socio-economic determinants

		Yes	No	Total
Q25. Are you a pensioner?	Number	125	104	229
	%	54.6%	45.4%	100.0%
Q26. Do you smoke cigarettes?	Number	51	178	229
	%	22.3%	77.7%	100.0%
Q27. Do you do any regular physical exercise?	Number	107	122	229
	%	46.7%	53.3%	100.0%
Q28. Do you have private health insurance?	Number	14	214	228
	%	6.1%	93.9%	100.0%
Q29. Have you completed a trade certificate or any other educational qualification since leaving school?	Number	79	149	228
	%	34.6%	65.4%	100.0%

4.2.4. SECTION B: QUESTIONS 30-36

As previously mentioned, Section B of the questionnaire was completed by the podiatrist on behalf of the participant to collect data relating to podiatric intervention, number of consultations had by participants at the Podiatry Departments, podiatric diagnoses, podiatric management, referral pathways and reasons for referrals.

Question 30 and 31 highlighted the percentage of new and follow up patients consulting at the various Podiatry Departments.



Question 32, as depicted in Table 4.6, identified the number of subsequent follow up consultations. Question 33, as depicted in table 4.7, highlighted an approximate time period since the participants last consultation.

Table 4.6 Number of subsequent follow up consultations

Number of follow up consultations		Frequency	Valid Percent
Valid	<5	84	55.6 %
	6-10	29	19.2 %
	11-20	12	7.9 %
	>20	26	17.2 %
	Total	151	100.0 %

Table 4.7 Approximate time period since last consultation

		Frequency	Valid Percent
Valid	1-2 months ago	104	73.2%
	3-5 months ago	23	16.2%
	6-12 months ago	10	7.0%
	>1 yr ago	5	3.5%
	Total	142	100.0%

Question 34 identified the various podiatric diagnosis/es for participants. Figure 4.14 illustrates the various podiatric diagnoses made by the resident podiatrist during consultations with participants. All diagnoses were grouped under various categories and each category was specifically explained in Table 4.8. Results will be represented as a percentage of cases, as participants may have had more than one diagnosis.

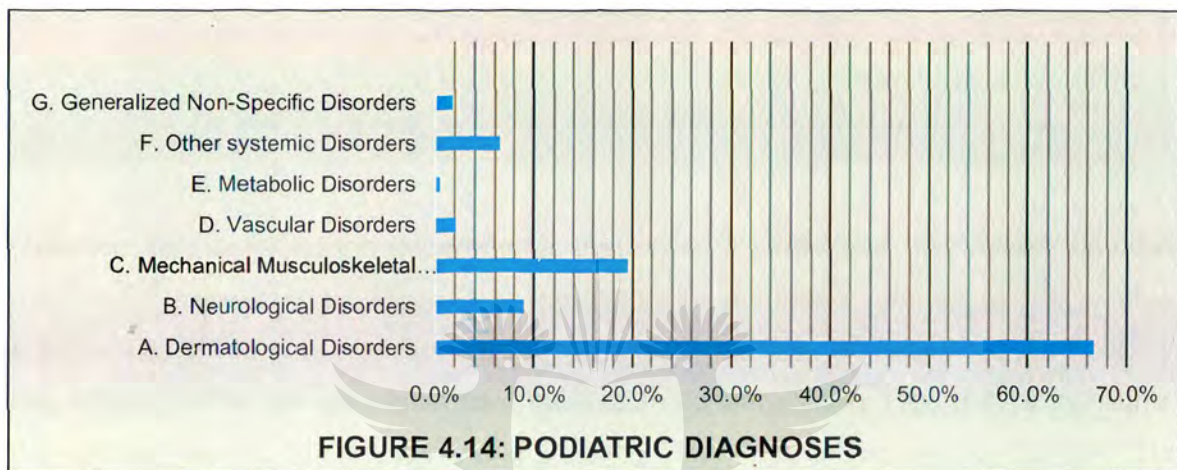
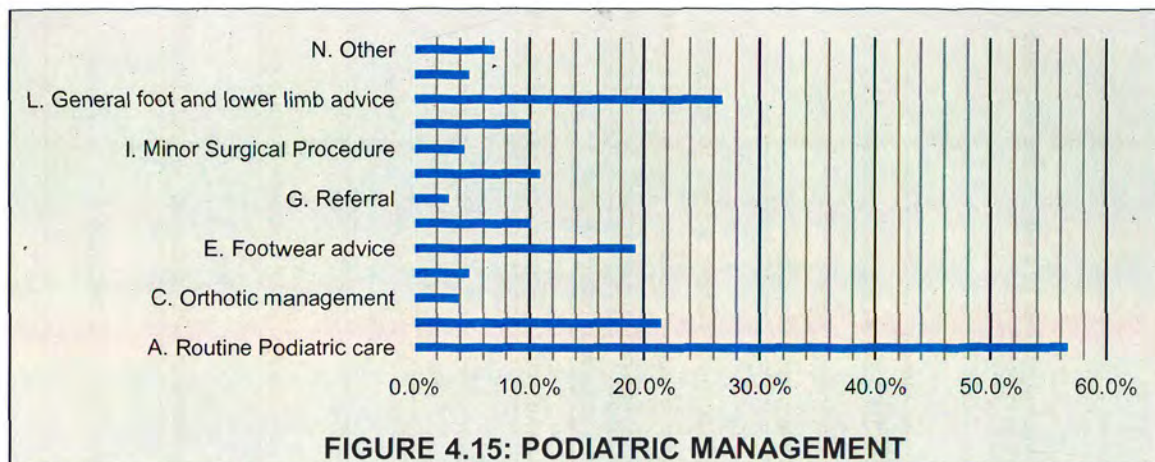


Table 4.8 indicates the specific diagnoses that fall within the various categories mentioned previously.



Question 35.1 identified the various management /treatment options offered to participants. Results in Figure 4.15 have been represented as a percentage of cases, as there may have been multiple responses for each participant (n= 418). Question 35.2 identified other management / treatments options participants were given. Figure 4.16 indicates the 7% of total responses (n=13) that chose the “other” option.



Question 36A identified the department/s that referred participants to Podiatry and the reasons for these referrals. Figure 4.17 represents the number of referrals (n=231). Table 4.9 specifies the various practitioners or departments that referred patients to the Podiatry Department at the various health care facilities in Johannesburg. Figure 4.18 highlights the overall reasons for referral to the Podiatry Department. Table 4.10 identifies the department/ practitioner specific reasons for referral to the Podiatry Department.

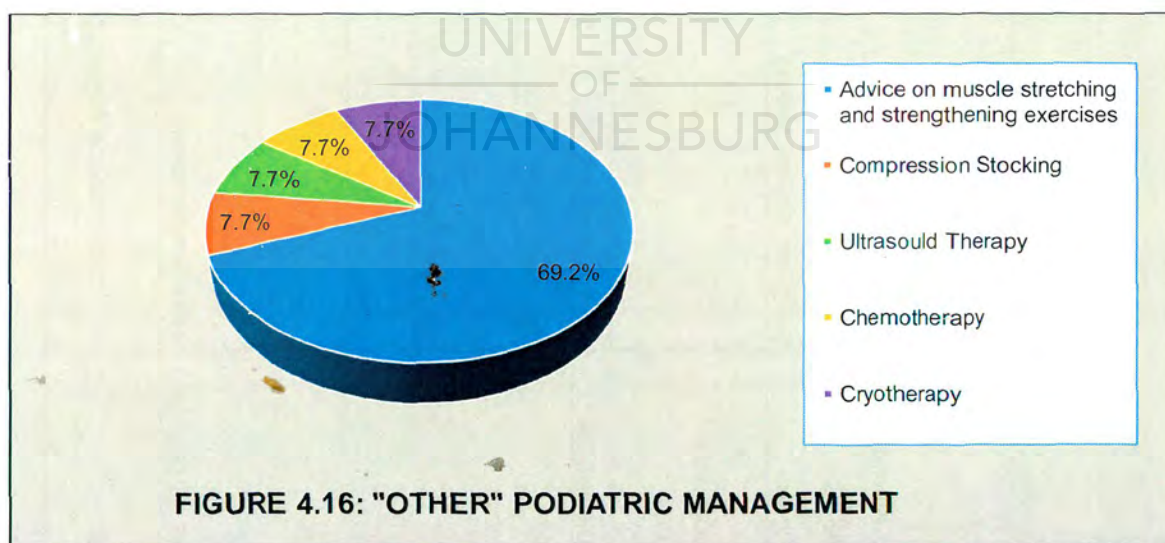
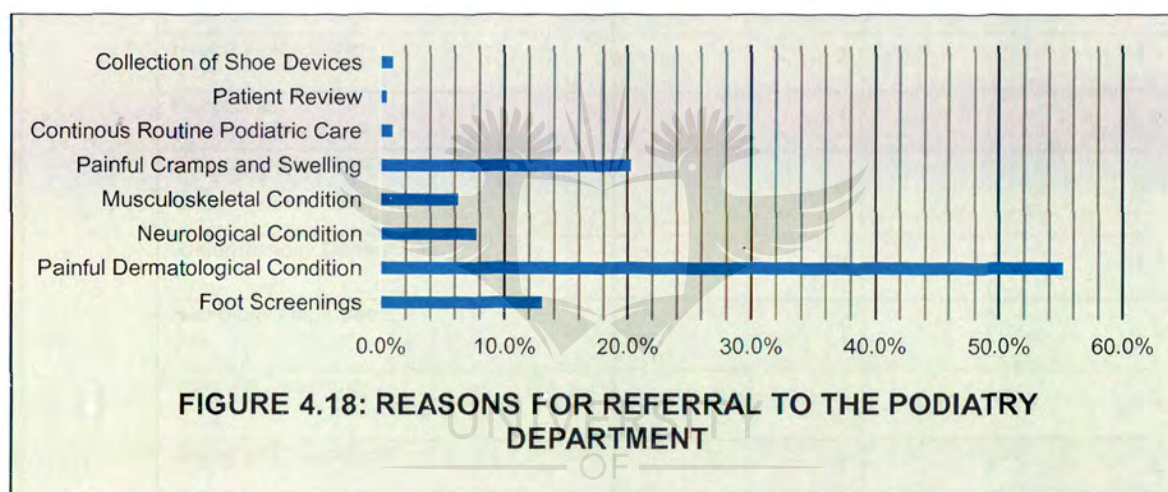
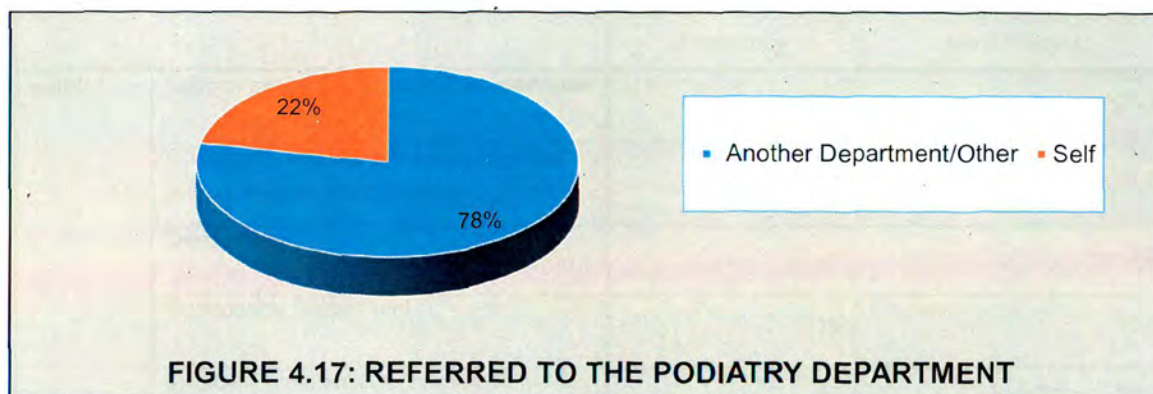


Table 4.8 Diagnoses

CATEGORY OF DISORDER	CATEGORY OF DIAGNOSIS	SPECIFIC DIAGNOSES
A. DERMATOLOGICAL DISORDERS	Hyperkeratotic lesions	Heloma vascularae, Heloma Neurovascularae, Hyperkeratosis, Heiloma dura and Dry Fissures
	Ulcers	Vascular ulcers- Ischemic/Venous, Neuropathic Ulcers, Pressure ulcers and Diabetic Ulcers, Traumatic Ulcers
	Fungal infections	Tinea Pedis and Onychomycosis
	Bacterial infections	Cellulitis
	Viral infections	Verruca Pedis
	Nail pathologies	Onychocryptosis, Onycholysis, Onychomycosis, Onychauxis and Subungual Hematoma
B. NEUROLOGICAL DISORDERS	Peripheral Neuropathy	Type 1 and Type 2 Diabetes Mellitus related and/ trauma related
C. MECHANICAL MUSCULOSKELETAL/ STRUCTURAL DISORDERS		Pes Planus, Idiopathic Erythromelalgia, Leg Length Discrepancy, Calcaneal Spurs, Plantarfaciitis, Patella Femoral Syndrome, Anterior/Posterior Tibialis Tendonopathy, Hallux Abducto Valgus, Bruised Heel Syndrome, Metatarsalgia, Achilles Tendonopathy and Subungual exostosis
D. VASCULAR DISORDERS	Peripheral Vascular Disease	Peripheral Arterial and Peripheral Venous Insufficiencies
E. METABOLIC DISORDERS		Gout
F. OTHER SYSTEMIC DISORDERS	Diabetes Mellitus	Diabetic foot screenings with no diagnoses
	Osteoarthritis	Hip, knee, ankle and foot
	Rheumatoid Arthritis	Rheumatoid nodules and bursas
G. GENERALISED NON-SPECIFIC DISORDERS		Non-specific foot, ankle or leg pain, idiopathic lower limb edema and leg cramps



Question 36B identified the various departments that the Podiatry Departments referred participants to and the reason/s for these referrals. Table 4.11 and Figure 4.19 indicates the number of referrals by the Podiatry Departments (n=235). Figure 4.20 illustrates the reasons for these referrals. Table 4.12 indicates department/ practitioner specific reasons for referral by the Podiatry Department.

Table 4.9 Departments that referred to the Podiatry Department

		Frequency	Valid Percent
Valid	Endocrinology Department/ Diabetic Nurse	48	26.7
	Community Clinic/ Surrounding Hospital/ Private Podiatry Clinic/ Prison	23	12.8
	Dermatology Department	4	2.2
	Orthopaedic Department	19	10.6
	Medical Outpatients Department/Polyclinic	47	26.1
	Sports Clinic	1	.6
	Hypertension Clinic	2	1.1
	Pain Clinic	1	.6
	Surgical Department	6	3.3
	Rheumatology Department	13	7.2
	Neurology Department	1	.6
	Vascular Department	3	1.7
	Oncology Department	1	.6
	Physiotherapy Department	2	1.1
	General Practitioner	8	4.4
	Dietician	1	.6
	Total	180	100.0
Missing	System	51	
Total		231	

Table 4.10 Department/ practitioner specific reasons for referral to the Podiatry Department

<p><u>Endocrinology Department</u></p> <p>Diabetic foot screening, Burning/ paraesthesia / neuropathy, Night cramps, Leg/foot pain, Painful knee/ heels, Painful callosities, Leg/foot ulcer</p>	<p><u>Orthopedic Department</u></p> <p>Painful callosities, Foreign body, Leg length discrepancy, Post-operative care for bunionectomy, Painful heel/ plantar fasciitis, Club foot deformity, Various nail conditions, Flat feet, Shoe devices</p>
<p><u>Community Clinic/ Surrounding Hospital/ Private Podiatry Clinic/ Prison</u></p> <p>Foot screening, Leg/ foot ulcers, Painful feet/ legs/ toes, Ingrowing toenail, Painful plantar wart, Swollen feet/ leg</p>	<p><u>Medical Outpatient Department/ Polyclinic</u></p> <p>Foot screening, Flat feet, Bunions, Leg/foot ulcer, Swollen foot/leg, Various nail condition, Fungal infection, Painful callosities, Heel pain/ calcaneal spur/ plantar fasciitis, Foot/ leg trauma</p>
<p><u>Dermatology Department</u></p> <p>Painful callosities and Burning feet</p>	<p><u>Sports Clinic</u></p> <p>Heel pain</p>
<p><u>Hypertension Clinic</u></p> <p>Painful callosities and Nail trauma</p>	<p><u>Pain Clinic</u></p> <p>Foot screening</p>
<p><u>Vascular Clinic</u></p> <p>Leg/foot ulcer and Painful callosities</p>	<p><u>Surgical Department</u></p> <p>Foot laceration and Leg/foot ulcer</p>
<p><u>Oncology Department</u></p> <p>Nail condition</p>	<p><u>Physiotherapy Department</u></p> <p>Leg length discrepancy and Shoe devices</p>
<p><u>Rheumatology Department</u></p> <p>Painful callosities, Foot screening, Painful feet and Shoe devices</p>	<p><u>Neurology Department</u></p> <p>Muscle weakness and Leg/foot pain</p>
<p><u>General Practitioner</u></p> <p>Painful callosities, Cold feet, Flat feet and Painful feet/ leg/ toes</p>	<p><u>Dietician</u></p> <p>Painful feet</p>
<p><u>Self-Referral</u></p> <p>Painful callosities, Various nail conditions, Plantar wart, Bunion, Painful foot/ leg/ toes, Foot screenings, Leg/ foot ulcer and Itchy feet</p>	

Table 4.11 Referral by the Podiatry Department

		Responses		% of Cases
		N	%	
Referred To from podiatry	Back to Podiatry Department	214	91.1%	94.7%
	Orthopaedic Department	3	1.3%	1.3%
	Casualty	2	.9%	.9%
	Surgical Department	1	.4%	.4%
	Neurology Department	1	.4%	.4%
	Physiotherapy Department	3	1.3%	1.3%
	Radiology Department	7	3.0%	3.1%
	Vascular Department	2	.9%	.9%
	Stoma Clinic	1	.4%	.4%
	Endocrinology Department	1	.4%	.4%
Total		235	100.0%	104.0%

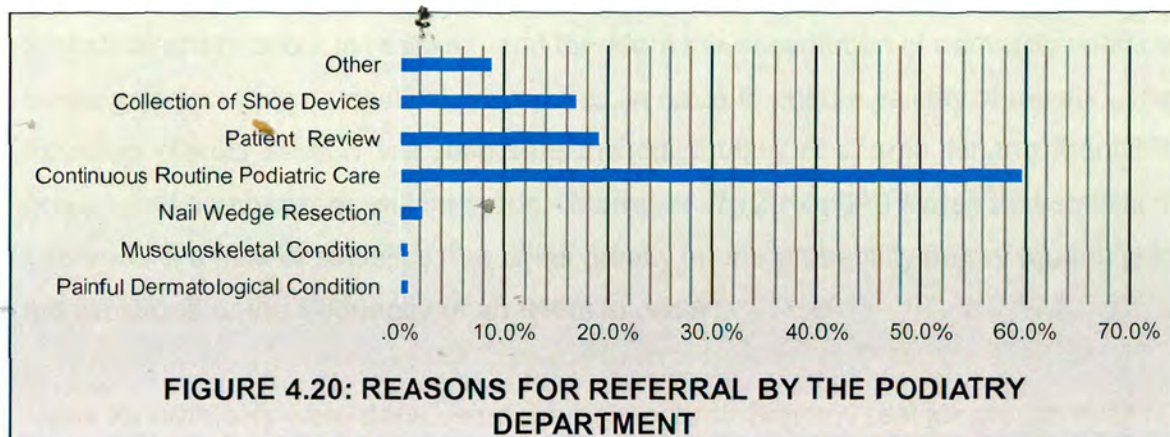
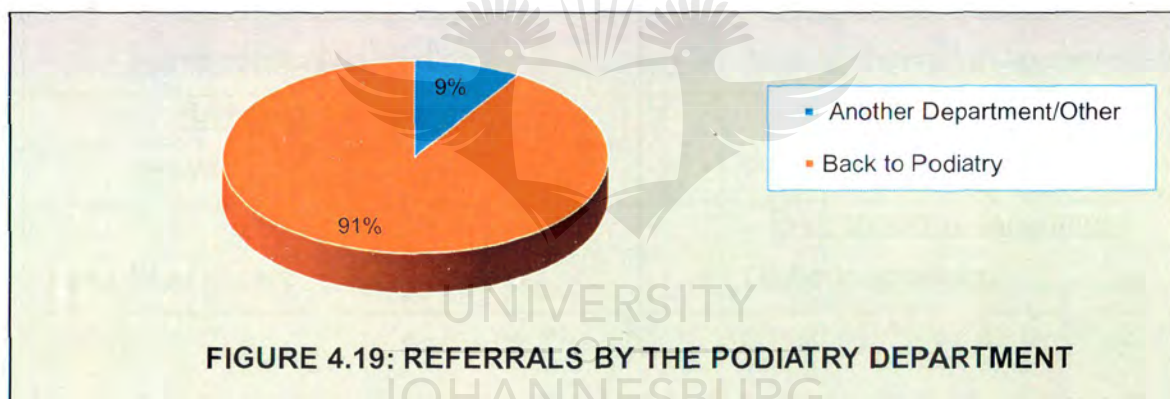


Table 4.12 Department/ practitioner specific reasons for referral by the Podiatry Department

<p><u>Back to Podiatry Department</u></p> <ul style="list-style-type: none"> • Continuous routine podiatric care • Diabetic foot screening • Review of fungal infection • Collection of shoe devices • Review of neuropathic pain • Nail surgery and post-operative care • Wound care • Review of heel pain 	<p><u>Orthopaedic Department</u></p> <ul style="list-style-type: none"> • Correction of leg length discrepancy • Cortisone injection • Bunionectomy
<p><u>Casualty</u></p> <ul style="list-style-type: none"> • Sutures 	<p><u>Surgical Outpatients Department</u></p> <ul style="list-style-type: none"> • Osteomyelitis
<p><u>Neurology Department</u></p> <ul style="list-style-type: none"> • Nerve conduction studies 	<p><u>Physiotherapy Department</u></p> <ul style="list-style-type: none"> • Muscle strengthening exercises
<p><u>Radiology Department</u></p> <ul style="list-style-type: none"> • X-rays 	<p><u>Vascular Department</u></p> <ul style="list-style-type: none"> • Peripheral arterial disease
<p><u>Stoma clinic</u></p> <ul style="list-style-type: none"> • Wound care 	<p><u>Endocrinology department</u></p> <ul style="list-style-type: none"> • Diabetic screening

4.3. RESULTS: NORMALITY AND COMPARISONS

Statistical errors occur in research and therefore the assumption of normality must be investigated for many statistical procedures, in order to ensure validity of results. The following results section will represent the distribution of scores for the identified groups and comparisons will be made. Maree *et al.* (2010:198) states that statistical inference is a field of statistics that relies greatly on the probability theory (quantifying the likelihood or the frequency of an event to occur).

Tests for normality were done using the Kolmogorov-Smirnov test for groups over 50 and the Shapiro-Wilk test for groups less than 50. In this study, for the majority of instances the scores appeared to be not normally distributed, highlighting that for each

question the chosen options varied between participants i.e. there was a varying degree of foot pain, foot function, general foot health, footwear and generic health in the majority of instances.

Parametric tests were used when scores were normally distributed and non-parametric tests were used when scores were not normally distributed. The distribution of scores with regards to foot health (foot pain, foot function, general foot health, foot function) and generic health were identified and compared within the following groups:

- New and follow up patients;
- Number of consultations;
- Gender;
- Podiatric diagnoses;
- Health insurance; and
- Education.

The following scores are applicable to the various subcategories and domains within the questionnaire:

- The total scoring scale for foot pain ranged from 1 (minimal foot pain) to 20 (severe foot pain);
- The total scoring scale for foot function ranged from 1 (excellent foot function) to 20 (poor foot function);
- The total scoring scale for the general foot health ranged from 1 (excellent general foot health) to 10 (poor general foot health);
- The total scoring scale for footwear ranged from 1 (minimal limitations with footwear) to 15 (severe limitations with footwear); and
- The total scoring scale for the generic health ranged from 1 (excellent generic health) to 72 (poor generic health).

The median marks the mid-point of the data i.e. half the scores are greater than or equal to this value and half are less.

4.3.1. NEW AND FOLLOW UP PATIENTS

Table 4.13 indicates the distribution of scores in new and follow up patients. Table 4.14 and 4.15 highlights the comparisons of foot health status between new and follow up patients. It is evident from these two tables that there does not seem to be any differences between new and follow up patients with regards to their foot pain, foot function and footwear. Neither are there any differences in scores noted in the sub-category of generic health. There is however, a difference noted in the area of general foot health. The results in Table 4.14 indicate that both new and follow up patients have an overall poor general foot health, however, the new patients' general foot health was poorer than the follow up patients.

Table 4.13 Distribution of scores: New and follow up patients

		Kolmogorov-Smirnov ^a			Distribution	Median
		Statistic	Df	Sig.		
Foot Pain	New patient	.122	75	.008	Not normally distributed	15.000
	Follow up patient	.079	153	.020	Not normally distributed	13.000
Foot Function	New patient	.100	75	.060	Normally distributed	12.000
	Follow up patient	.120	153	.000	Not normally distributed	10.000
General Foot Health	New patient	.235	75	.000	Not normally distributed	8.000
	Follow up patient	.181	153	.000	Not normally distributed	8.000
Footwear	New patient	.162	75	.000	Not normally distributed	11.000
	Follow up patient	.150	153	.000	Not normally distributed	11.000
Generic Health	New patient	.063	74	.200*	Normally distributed	39.500
	Follow up patient	.056	153	.200*	Normally distributed	38.000

Table 4.14 Comparisons: New patients vs. Follow up patients

		N	Mean	Std. Deviation	Mean Rank
Foot Pain	New patient	75	13.91	4.281	125.75
	Follow up patient	153	12.74	4.503	108.98
Foot Function	New patient	75	11.92	4.626	123.12
	Follow up patient	153	11.02	4.820	110.27
General Foot Health	New patient	75	8.16	1.994	129.27
	Follow up patient	153	7.39	2.297	107.26
Footwear	New patient	75	10.16	3.357	113.03
	Follow up patient	153	10.24	3.372	115.22
Generic Health	New patient	74	39.66	10.036	118.12
	Follow up patient	153	38.81	10.329	112.01

Table 4.15 Test statistics: New patients vs. Follow up patients

	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Foot Pain	4893.500	16674.500	-1.808	.071
Foot Function	5091.000	16872.000	-1.385	.166
General Foot Health	4629.500	16410.500	-2.438	.015
Footwear	5627.000	8477.000	-.238	.812
Generic Health	5356.000	17137.000	-.658	.511

4.3.2. NUMBER OF FOLLOW UP CONSULTATIONS

Table 4.16 highlights the distribution of scores in patients who consulted at the Podiatry Department less than 5 times and more than 5 times. It is interesting to note, as highlighted in Table 4.17, that there does not appear to be any differences to participant's foot pain, foot function, general foot health, footwear and generic health when compared to the number of podiatry consultations that they have had.

Table 4.16. Distribution of scores: Number of follow up consultations

		Kolmogorov-Smirnov ^a			Distribution	Median
		Statistic	Df	Sig.		
Foot Pain	Less than 5	.098	84	.047	Not normally distributed	13.000
	More than 5	.108	67	.052	Normally distributed	12.000
Foot Function	Less than 5	.108	84	.017	Not normally distributed	11.000
	More than 5	.124	67	.012	Not normally distributed	10.000
General Foot Health	Less than 5	.169	84	.000	Not normally distributed	8.000
	More than 5	.202	67	.000	Not normally distributed	8.000
Footwear	Less than 5	.136	84	.001	Not normally distributed	11.000
	More than 5	.172	67	.000	Not normally distributed	11.000
Generic Health	Less than 5	.083	84	.200*	Normally distributed	38.000
	More than 5	.087	67	.200*	Normally distributed	39.000

Table 4.17. Test statistics: Foot Health Status vs. Number of Follow up Consultations

	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Foot Pain	2801.500	5079.500	-.047	.963
Foot Function	2657.000	4935.000	-.590	.555
General Foot Health	2669.000	4947.000	-.556	.578
Footwear	2797.000	6367.000	-.064	.949
Generic Health	2782.000	6352.000	-.120	.905

4.3.3. MALES AND FEMALES

Table 4.18 indicates the distribution of scores in male and female patients. Table 4.19 and 4.20 compares foot health status between genders. The results depicted in the tables indicate that there does not seem to be any differences between male and female participants with regards to their foot pain and foot function. However, there seems to be differences noted across genders in the general foot health and footwear domains and generic health sub-category. The results indicate that female patients had a poorer general foot health, greater difficulty in finding shoes that fit their feet or did not hurt their feet, greater limitations in the types of shoes that they could wear and had poorer generic health.

Table 4.18 Distribution of scores: Males and females

		Kolmogorov-Smirnov ^a			Distribution	Median
		Statistic	Df	Sig.		
Foot Pain	Male	.110	68	.039	Not normally distributed	12.000
	Female	.096	157	.001	Not normally distributed	14.000
Foot Function	Male	.109	68	.043	Not normally distributed	10.000
	Female	.117	157	.000	Not normally distributed	11.000
General Foot Health	Male	.226	68	.000	Not normally distributed	8.000
	Female	.208	157	.000	Not normally distributed	8.000
Footwear	Male	.130	68	.006	Not normally distributed	8.000
	Female	.153	157	.000	Not normally distributed	11.000
Generic Health	Male	.105	68	.058	Normally distributed	37.000
	Female	.051	156	.200*	Normally distributed	39.000

Table 4.19 Comparisons of Foot health Status vs. Gender

		N	Mean	Std. Deviation	Mean Rank
Foot Pain	Male	68	12.40	4.378	100.78
	Female	157	13.50	4.433	118.29
Foot Function	Male	68	10.74	4.531	104.99
	Female	157	11.57	4.825	116.47
General Foot Health	Male	68	7.25	2.126	99.94
	Female	157	7.80	2.280	118.66
Footwear	Male	68	8.75	3.759	88.59
	Female	157	10.78	3.033	123.57
Generic Health	Male	68	36.43	9.525	96.94
	Female	156	40.03	10.306	119.28

Table 4.20 Test statistics: Foot health Status vs. Gender

	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Foot Pain	4507.000	6853.000	-1.857	.063
Foot Function	4793.500	7139.500	-1.217	.224
General Foot Health	4450.000	6796.000	-2.039	.041
Footwear	3678.000	6024.000	-3.727	.000
Generic Health	4246.000	6592.000	-2.374	.018

4.3.4. PRIVATE HEALTH INSURANCE

Table 4.21 indicates the distribution of scores in participants who have and do not have private health insurance. When comparing foot health status to participants with or without private health insurance, no inferential statistics could be performed as the groups sizes were too small/different. However, there appeared to be a difference noted in the domain of footwear. It would appear by the the data obtained that participants without private health insurance had greater difficulty in finding shoes that fit or did not hurt their feet and found a greater limitation in being able to wear different types of shoes.

Table 4.21 Distribution of scores: Private health insurance

		Kolmogorov-Smirnov ^a			Shapiro-Wilk			Distribution	Median
		Statistic	df	Sig.	Statistic	df	Sig.		
Foot Pain	Yes	.197	14	.148	.900	14	.113	Normally distributed	12.000
	No	.085	214	.001	.959	214	.000	Not normally distributed	14.000
Foot Function	Yes	.163	14	.200	.889	14	.077	Normally distributed	8.500
	No	.104	214	.000	.955	214	.000	Not normally distributed	11.000
General Foot Health	Yes	.217	14	.074	.914	14	.180	Normally distributed	8.000
	No	.186	214	.000	.874	214	.000	Not normally distributed	8.000
Footwear	Yes	.136	14	.200	.960	14	.727	Normally distributed	7.500
	No	.158	214	.000	.938	214	.000	Not normally distributed	11.000
Generic Health	Yes	.138	14	.200	.957	14	.673	Normally distributed	37.000
	No	.051	213	.200	.981	213	.005	Normally distributed	39.000

4.3.5. TRADE CERTIFICATE OR ANY OTHER EDUCATIONAL QUALIFICATION SINCE LEAVING SCHOOL

Table 4.22 highlights the distribution of scores in participants who have and have not completed a trade certificate or any other educational qualification since leaving

school. Table 4.23 and 4.24 indicates that no differences were found between foot health status and education in the domains of general foot health and footwear and in the sub-category of generic health. There did however appear to be differences noted in the foot health status domain of foot pain and foot function. It was found that those participants who had no trade certificate or any other educational qualification since leaving school had greater levels and frequency of foot pain. The results also highlight that participants who had no trade certificate or any other educational qualification had a poorer foot function ie. their foot pain or condition led to a higher limitation or greater difficulties in their physical and work activities.

Table 4.22 Distribution of scores: Trade certificate or any other educational qualification since leaving school

		Kolmogorov-Smirnov ^a			Distribution	Median
		Statistic	df	Sig.		
Foot Pain	Yes	.102	79	.040	Not normally distributed	12.000
	No	.092	149	.004	Not normally distributed	14.000
Foot Function	Yes	.135	79	.001	Not normally distributed	10.000
	No	.115	149	.000	Not normally distributed	11.000
General Foot Health	Yes	.217	79	.000	Not normally distributed	8.000
	No	.193	149	.000	Not normally distributed	8.000
Footwear	Yes	.136	79	.001	Not normally distributed	11.000
	No	.171	149	.000	Not normally distributed	11.000
Generic Health	Yes	.077	79	.200*	Normally distributed	38.000
	No	.053	148	.200*	Normally distributed	39.000

Table 4.23 Comparisons: Foot health status vs. Education

		N	Mean	Std. Deviation	Mean Rank
Foot Pain	Yes	79	11.94	4.708	97.34
	No	149	13.77	4.224	123.60
Foot Function	Yes	79	10.23	4.790	99.35
	No	149	11.88	4.645	122.53
General Foot Health	Yes	79	7.47	2.171	109.23
	No	149	7.68	2.299	117.3
Footwear	Yes	79	9.95	3.530	109.77
	No	149	10.32	3.315	117.01
Generic Health	Yes	79	38.14	9.283	109.61
	No	148	39.39	10.684	116.34

Table 4.24 Test statistics: Foot health Status vs. Education

	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Foot Pain	4530.000	7690.000	-2.866	.004
Foot Function	4688.500	7848.500	-2.532	.011
General Foot Health	5469.000	8629.000	-.904	.366
Footwear	5511.500	8671.500	-.794	.427
Generic Health	5499.000	8659.000	-.737	.461

4.3.6. PODIATRIC DIAGNOSES

The distribution of the various groups of systemic disease scores were analysed and the results obtained were as follows:

- Dermatological Disorders

The results indicated that there was a normal distribution of generic health scores in participants that had been diagnosed with a dermatological disorder. Foot pain, foot function, general foot health and footwear scores were not normally distributed for these disorders. It was also found that those participants who were diagnosed with a dermatological podiatric diagnosis/es had better generic health than those who had not, however, foot health remained indifferent.

- Neurological Disorders

The results indicated that there was a normal distribution of foot pain, foot function and generic health scores in participants that had been diagnosed with a neurological disorder. General foot health and footwear scores were not normally distributed for these disorders. No inferential statistics could be performed on the neurological disorders as the groups sizes were too small/different. However, there appeared to be no differences noted when comparing foot health status and neurological disorders.

- Mechanical Musculoskeletal/ Structural Disorders

The results indicated that there was a normal distribution of foot function and generic health scores in participants that had been diagnosed with a mechanical musculoskeletal/ structural disorder. Foot pain, general foot health and footwear scores were not normally distributed for these disorders. No inferential statistics could be performed on the musculoskeletal disorders as the groups sizes were too small/different. However, by the researchers own conclusions, there appeared to be differences noted when comparing foot health status and mechanical musculoskeletal disorders in the domains of foot function and general foot health. It appeared that participants that had been diagnosed with a mechanical musculoskeletal disorder had greater limitations or difficulties in their physical or work activities and an overall poorer general foot health.

- Vascular Disorders

The results indicated that there was a normal distribution of foot pain, foot function, footwear and generic health scores in participants that had been diagnosed with a vascular disorder. General foot health scores were not normally distributed for these disorders. No inferential statistics could be performed on the vascular disorders as the groups sizes were too small/different. However, by the researchers own conclusions, there appeared to be a difference noted when comparing foot health status and vascular disorders in the domain general foot health. It appeared that participants that had been diagnosed with a vascular disorder had an overall poorer general foot health.

- Other Systemic Disorders

The results indicated that there was a normal distribution of foot pain, foot function, general foot health, footwear and generic health scores in participants that had been diagnosed with another systemic disorder that did not fall within the categories mentioned above. No inferential statistics could be performed on other systemic disorders as the groups sizes were too small/different. However, by the researchers own conclusions, there appeared to be differences noted when comparing foot health status and other systemic disorders in the domains of foot pain and foot function. It appeared that participants that had been diagnosed with other systemic disorders lesser levels and frequency of foot pain and less limitations or difficulties in their physical or work activities.

- Generalized non-specific disorders

The results indicated that there was a normal distribution of foot pain, foot function, general foot health and generic health scores in participants that had been diagnosed with a generalized non-specific disorder. Footwear scores were not normally distributed for these disorders. No inferential statistics could be performed on generalized non-specific disorders as the groups sizes were too small/different. However, the data highlighted that there appeared to be differences noted when comparing foot health status and generalized non-specific disorders in the domains of footwear. It appeared that participants that had been diagnosed with a generalised non-specific disorder had greater difficulty in finding shoes that fit or did not hurt their feet and found a greater limitation in being able to wear different types of shoes.

4.4. RESULTS: NORMALITY AND CORRELATIONS

The following results section will represent the distribution of scores for the entire sampled population and correlations will be made. Tests for normality were done using the Kolmogorov-Smirnov test for groups over 50. Correlations were found between

age, systemic diseases, within the various foot health domains and generic health sub-categories.

4.4.1. DISTRIBUTION OF OVERALL SCORES

Table 4.25 highlights the distribution of overall scores in the areas of participants age, systemic diseases, foot pain, foot function, general foot health, footwear and generic health.

Table 4.25 Distribution of overall scores

	Kolmogorov-Smirnov ^a			Distribution	Median
	Statistic	Df	Sig.		
Age	.076	224	.003	Not normally distributed	58.000
Overall systemic disease	.178	231	.000	Not normally distributed	2.000
Foot Pain	.092	231	.000	Not normally distributed	14.000
Foot Function	.104	231	.000	Not normally distributed	11.000
General Foot Health	.191	231	.000	Not normally distributed	8.000
Footwear	.154	231	.000	Not normally distributed	11.000
Generic Health	.050	230	.200	Normally distributed	39.000

4.4.2. CORRELATIONS

Many correlations have been noted within the study results and have been depicted in Table 4.26 and further summarized.

Table 4.26 Correlations between foot health status, systemic disease and age

		Age	Systemic disease	Foot Pain	Foot Function	General Foot Health	Footwear	Generic Health
Age	Pearson Correlation	1	.264**	.049	.035	.087	.162*	.137*
	Sig. (2-tailed)		.000	.469	.601	.194	.015	.042
	N	224	224	224	224	224	224	223
Systemic disease	Pearson Correlation	.264**	1	.079	.136*	.106	.273**	.375**
	Sig. (2-tailed)	.000		.231	.039	.109	.000	.000
	N	224	231	231	231	231	231	230
Foot Pain	Pearson Correlation	.049	.079	1	.586**	.565**	.258**	.360**
	Sig. (2-tailed)	.469	.231		.000	.000	.000	.000
	N	224	231	231	231	231	231	230
Foot Function	Pearson Correlation	.035	.136*	.586**	1	.482**	.198**	.441**
	Sig. (2-tailed)	.601	.039	.000		.000	.002	.000
	N	224	231	231	231	231	231	230
General Foot Health	Pearson Correlation	.087	.106	.565**	.482**	1	.329**	.426**
	Sig. (2-tailed)	.194	.109	.000	.000		.000	.000
	N	224	231	231	231	231	231	230
Footwear	Pearson Correlation	.162*	.273**	.258**	.198**	.329**	1	.322**
	Sig. (2-tailed)	.015	.000	.000	.002	.000		.000
	N	224	231	231	231	231	231	230
Generic Health	Pearson Correlation	.137*	.375**	.360**	.441**	.426**	.322**	1
	Sig. (2-tailed)	.042	.000	.000	.000	.000	.000	
	N	223	230	230	230	230	230	230

4.4.2.1. Correlations with age

Table 4.26. highlights that, based on the participants age, there appeared to be correlations found with the participants systemic disease/s, footwear and generic health. The results indicated older participants had more systemic diseases, therefore worse generic health and also greater footwear difficulties. It is also pertinent to note

that this result could be biased in a sense that the mean age of the population was 57 years old.

4.4.2.2. Correlations with systemic disease/s

Based on the participants systemic disease/s, the results indicated that there exists a correlation with the participants foot function, footwear and generic health. It was found that participants with a greater number of systemic diseases had poorer foot function, greater footwear difficulties and a poor generic health.

4.4.2.3. Correlations with foot pain

It was noted from the results that, based on the participants foot pain, there appeared to be a correlation noted with the participants foot function, general foot health, footwear and generic health. The results have indicated that participants with a greater amount of foot pain had worse foot function, greater difficulties with their footwear and a poorer generic health.

4.4.2.4. Correlations with foot function

Based on participants foot function, the results have indicated that there appears to be a correlation noted with the participants systemic disease/s, foot pain, general foot health, footwear and generic health. It appears that a participant with poorer foot function had more systemic diseases, poorer foot health, greater difficulties with their footwear and poorer generic health.

4.4.2.5. Correlations with general foot health

The results highlight, based on the participants general foot health, that correlations exist with the participants foot pain, foot function, footwear and generic health. Those

participants that presented with a poorer general foot health had greater foot pain, poorer foot function, greater footwear difficulties and poorer generic health.

4.4.2.6. Correlations with footwear

As highlighted previously it appears that, based on the participants footwear, correlations were found with the participants age, systemic disease/s, foot pain, foot function, general foot health and generic health. The results have indicated that participants who had greater footwear difficulties were older, had more sytemic diseases, greater foot pain, poorer foot function, poorer general foot health and poorer generic health.

4.4.2.7. Correlations with generic health

The results have highlighted that, based on the participants generic health, correlation exist with participants age, systemic disease/s, foot pain, foot function, general foot health and footwear. It was found that participants that had poorer generic health were older, had more systemic diseases, greater foot pain, poorer foot function, poorer general foot health and greater footwear difficulties.

4.5. CONCLUSION

A detailed analysis of the results of this study has been provided in this Chapter. The results were analysed as descriptives and frequencies, distributions, comparisons and correlations. The results were represented in the form of tables, graphs and charts. This Chapter identified frequencies, comparisons and correlations that have occurred in the areas of foot pain, foot function, general foot health, footwear, generic health and variables such as socio-economic status, co-morbidities, service utilization, podiatric management, treatment and referral pathways. Many comparisons and correlations have been made and will be discussed further in Chapter five.

CHAPTER 5: DISCUSSION

5.1. INTRODUCTION

This Chapter highlights the results of the study as represented in Chapter 4. The aim of this study was to measure foot HRQoL services at various health care facilities in Gauteng, South Africa. The results represented in Chapter 4 have identified the patient's foot health status/ foot HRQoL within four domains namely; foot pain, foot function, footwear and general foot health. To determine generic measures of the patient's health, standard demographic data and variables such as gender, age, socio economic status, co-morbidities and service utilization will be identified. Furthermore, identifying and comparing the foot health status of new patients to follow up patients; categorizing the patient's podiatric diagnosis and management/treatment at the time of current consultation, determining and establishing the patient's pathway of referral to and from Podiatry and the reasons thereof, determining a link or co-dependency between foot HRQoL, demographics, clinical characteristics and referral pathways.

5.2. STANDARD DEMOGRAPHIC DATA AND VARIABLES

5.2.1. AGE

Findings from this study have identified that more than half the participants (54.6%) that consulted at the various Podiatry Departments around Gauteng were pensioners, with a mean age of 57.3 years old. A study conducted by Menz (2009:4) on Podiatry services within the Enhanced Primary Care Program in Australia, highlighted that 75% of podiatric services provided were to those over the age of 65 years old. Farndon *et al.* (2009:3), highlighted that the mean age of participants that consulted for continuous routine podiatric care was 72.9 years.

The results from this study identified correlations to exist between age of the participant, systemic diseases and generic health. It was found that older participants had more systemic diseases and therefore a poorer generic health. Older participants

also had greater footwear difficulties. It was interesting to note though, that there existed no correlation between the age of the participant and their foot health status in the domains of foot pain, foot function and general foot health. This goes against many studies which highlight that advancing age is the most obvious risk factor for the development of foot problems, however Menz (2008:6) has alluded to the fact that there has been evidence which suggests that the correlation of advancing age and foot problems seem to exist only up until approximately the age of 65 years old.

The correlation that exists in this study regarding an increase in the number of systemic diseases with age and therefore a poorer generic health could account for the lack of association with age, foot pain, foot function and general foot health. The reason for this could be, as highlighted by Menz (2008:6), that foot related problems/symptoms are associated with a certain level of weight-bearing activity. Therefore, as noted in this study, older participants have a poorer generic health and thereby perhaps a more sedentary lifestyle causing them to have a lower level of weight-bearing activity.

5.2.2. GENDER

It appears from this study that the majority of the participants that had consulted to the various Podiatry Departments around Gauteng were female (69.8%). The reason for this could be, as discussed later in this Chapter, female participants have been shown to have a poorer general foot health, greater footwear difficulties and limitations and a poorer generic health. The results of this study concur with many other studies that identified female participants who seem to have a greater need for medical or podiatric services (Nname et al, 2011:37; Menz, 2008:6; Harris *et al.* 2011:S106). Farndon (2009:4) identified that 63.5% of females in the study group required continuous podiatric care, compared to males, thereby giving reason for a poorer general foot health.

Chapter 4 highlights that a higher percentage of female participants had consulted at the various Podiatry Departments in Gauteng. Female participants also seemed to have indicated greater footwear difficulties and limitations. This could be perhaps

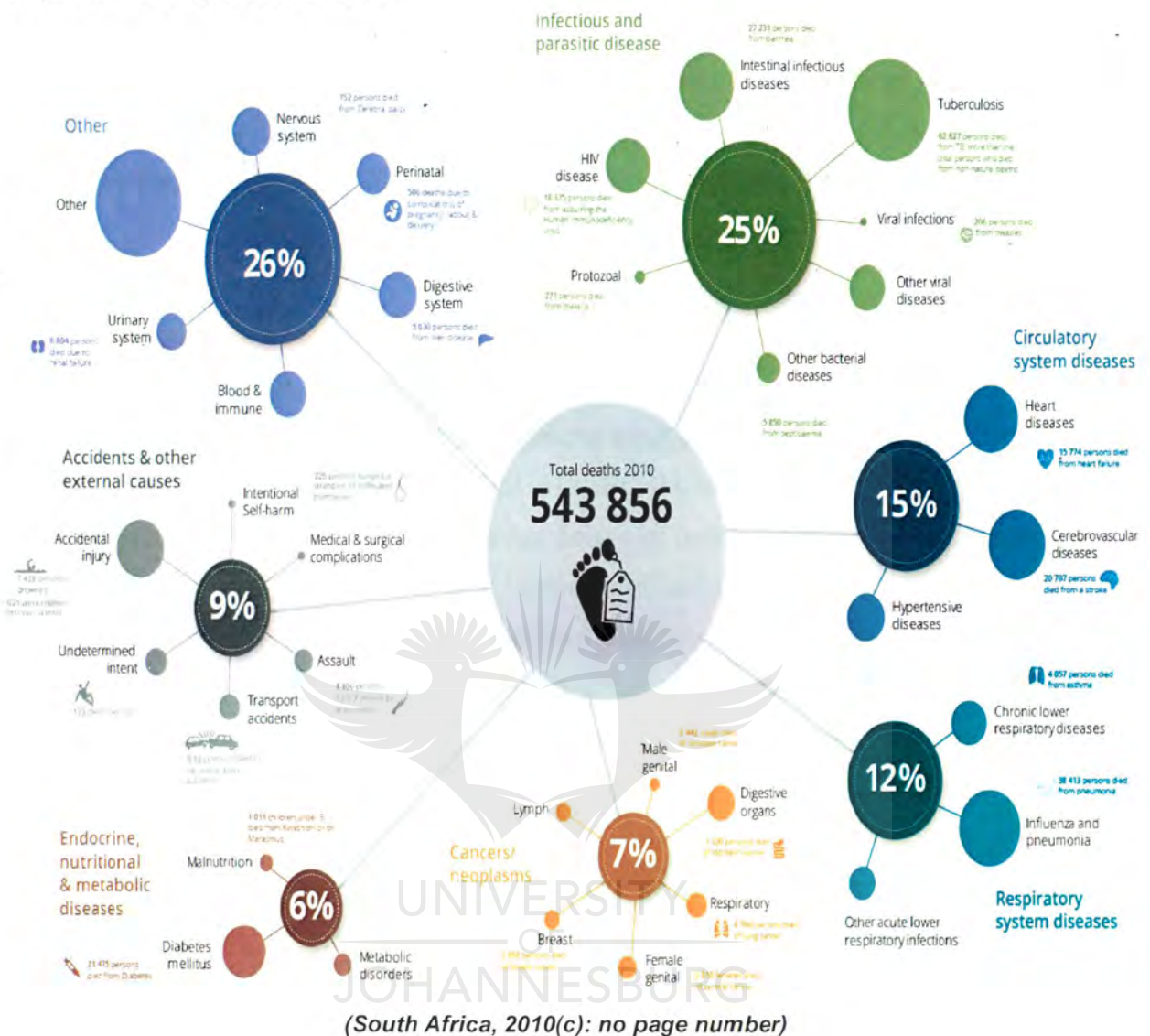
influenced by factors such as fashion trends and or the common poorly constructed female footwear with an elevated heel and narrow a toe box. However, it was interesting that no differences were noted between the participants' gender and their foot health status in the areas of foot pain and foot function. As cited by Menz (2008:6), pain tolerance may lead to female patients reporting mainly on musculoskeletal pain or pain elsewhere in the body. Menz *et al.* (2011: 1471-2474), also highlighted that women are more likely to report functional limitations than men.

5.2.3. SYSTEMIC DISEASES

From this study, the five leading diseases that participants, who consulted at the various Podiatry clinics, were taking prescription medication for were hypertension (76.6%), diabetes mellitus (50.6%), hyperlipidemia (27.9%), osteoarthritis (22.9%) and other musculoskeletal disorders (18.8%). The percentages depicted are the total percentage of cases highlighting that participants could have been found to be taking prescription medication for more than one disease. According to Mayosi *et al.* (2009:1), there seems to be an increased burden of NCD's in rural communities and also affecting a greater number of poorer people living in urban settings, resulting in a higher demand for care for chronic diseases. In Australia, chronic medical conditions accounts for 80% of the total burden of disease and injury and the management of these chronic conditions is responsible for a considerable amount of health care expenditure (Menz, 2009:1). Figure 5.1.depicts the 10 leading causes of death in South Africa in 2010 (South Africa, 2010(c): no page number).

Correlations that have been found in this study indicate that participants with a greater number of systemic diseases had poorer foot function, greater footwear difficulties and a poor generic health. A study by Menz *et al.* (2008:3), identified an increase in the prevalence of foot pain in those participants diagnosed with diabetes mellitus, cardiovascular disease and osteoporosis.

Figure 5.1 Leading causes of death



5.2.1. SOCIO-ECONOMIC DETERMINANTS

A study by Ataguba *et al.* (2011: 5, 10) documents that in South Africa there appears to be a higher frequency of communicable and non-communicable diseases amongst the lower socio-economic groups. Harling *et al.* (2008:492-505), as cited by Ataguba (2011:6), identified negative correlations between TB and cigarette smoking, alcohol consumption, decreased educational attainment, unemployment and poverty.

5.2.4.1. Substance abuse

Results in this study have identified that overall nearly a quarter of participants (22.3%) smoked tobacco on a regular basis. In a South African study conducted by Van Heerden *et al.* (2009:4) the highest form of substance abuse was alcohol use (38.7%), followed by tobacco smoking (30%), cannabis use (8.4%) and other drug use (2%).

5.2.4.2. Regular exercise

The results from this study highlight that more than half (53.3%) did not partake in regular physical exercise. The Global Health Risks Report (WHO: 2009:11), highlighted that the fourth leading risk factor cause of death in 2004, around the world, was physical inactivity. This was a risk factor identified in all income groups ranging from low- income countries to high-income countries. Lambert (2012:1), highlights that non-communicable diseases (NCD's) account for a large portion of mortality rates globally and explains that the WHO have strongly emphasized the need for monitoring, prevention and control of NCD's.

However this author mentions *"The WHO discussion paper presents 10 suggested voluntary targets including the reduction in deaths due to NCD's, cardiovascular disease and Diabetes, an overall reduction in blood pressure and obesity, as well as reduced smoking, alcohol and dietary salt intake, increased screening for cervical cancer and the elimination of trans-fats from the food supply. Physical activity is notable by its absence from this critical list of voluntary global targets for preventing and controlling NCD's.*

5.2.4.3. Education and health insurance

As expected, findings from this study have found that a limited number of participants had private health insurance (6.1%) and completed a trade certificate or any other educational qualification (34.6%) since leaving school. The study conducted by Harris *et al.* (2011: S104) on 21 159 individuals in South Africa found that almost half of the

individuals had only primary schooling or less and 88.4% of individuals did not have private health insurance. It was also found that the need for health care was greater in those individuals with a primary education or less compared to those that had a tertiary qualification. However, education was not associated with recent illness or injury.

The results from this study highlight the influence the lack of private health insurance and further educational qualifications has on the participants' foot health status.

5.3. PODIATRY

5.3.1. CONSULTATIONS

The majority of participants (67%) in this study that consulted at the various Podiatry Departments were follow up participants. This is consistent with a baseline audit undertaken in the UK by Fardon *et al.* (2009:4) that found that new patients only made up 9.6% of the total population consulting at the various Podiatry services in the NHS, with the rest being follow up patients.

The results from this study indicated that 55.6% of the participants who were follow up patients consulted at the Podiatry Departments less than five times and only 17.2% consulted more than 20 times. It found that 73.2% of participants' follow up consultations took place within one to two months of the initial consultation. This was interesting to note, since many studies have indicated that there could be a delay in care received at public health care facilities due to long queues or lack of appointments due to high patient numbers. A local small scale study done at a public health care facility in Gauteng, identified that waiting times for patients to receive appointments ranged from one week to 16 weeks and the average waiting time was about six weeks. This study also identified themes to explain some of the reasons for the waiting times, namely; availability of appointments, concurrent appointments, urgency, and patient delayed appointments (Zwiegelaar *et al.* 2013: 19-21).

5.3.2. DIAGNOSES

This study identified the most common podiatric diagnoses that were made at the various Podiatry Departments were dermatologically related (66.7%). The results of this study is consistent with a study conducted locally by Nname and Abruzzo (2011:39) and also Farndon *et al.* (2009:1-6) that highlighted dermatologically related diagnoses was most common. Farndon *et al.* (2009:2), identified from a summary of combined surveys that 20-78% of people suffer from corns, calluses and bunions and 28-56% have toenail problems requiring routing podiatric care.

The study also highlighted that musculoskeletal disorders accounted for 19.5% of the cases seen at the various Podiatry clinics around Gauteng. Roddy (2011:1), highlights that in Australia, out of the total musculoskeletal consultations at primary health care, only 8% involve musculoskeletal foot problems. This author suggests that although there is a large percentage of consultations in primary health care relating to musculoskeletal foot conditions, only a small proportion of those seek medical attention.

Neurological disorders, such as peripheral neuropathy, affected 9.1% of participants consulting at the various Podiatry clinics around Gauteng.

5.3.3. MANAGEMENT

It is evident from the results of this study that the most common management or treatment option provided to participants by the Podiatry Departments at the various health care facilities, was routine podiatric care (56.6%). Farndon *et al.* (2006:89-93), highlighted that studies that had been done in 1993 and 2002 regarding podiatric care, seemed to have concentrated mainly on palliative care despite the developments in modern Podiatry and noticed that no changes had been noticed within a 10 year period. The most common conditions, were identified to be nail cutting, debridement of corns and calluses, footwear and foot care advice. This was termed "core Podiatry". However, it seems that not much has changed in the past 20 years when comparing it to the South African podiatric context. The results of this study have indicated that

routine podiatric care or “core Podiatry” still remains the mainstay of care provided by the various Podiatry Departments around Gauteng. This was followed by management/ treatment options such as general lower limb and foot advice (36.8%), drug prescriptions (21.5%), footwear advice (19.3%), padding and strapping (11.0%), wound management and simple innersole management (10.1%), X-ray referral and injections (4.8%), minor surgical procedures (4.4%), orthotic management (3.8%), referral (3.1%) and the “other” option was selected in 7% of responses.

5.3.4. REFERRAL PATHWAYS

It was found that the majority of participants (78%) that had consulted at the various Podiatry Departments around Gauteng, were referred to Podiatry by another Department within that health care facility or surrounding clinics, therefore only a small number were self-referred. The specific Departments that have referred participants to the Podiatry Departments and the reasons for these referrals is highlighted in Chapter 4. It can be seen that the most common Departments that referred mostly to the Podiatry Departments were the Endocrinology Department and Medical Outpatients Department/ Polyclinic and the most common reasons for referral was for painful dermatological lesions (55.1%) and painful cramps and swelling (20.3%). This could anecdotally be the result of close working relationships between practitioners of Podiatry Departments and Endocrinology Departments at the various health care centres in Gauteng.

The results of this study highlights that the resident podiatrists, at the various health care centres, had referred 91% of participants that had consulted with them back to the Podiatry Department for a follow up consultation. It was interesting to note that only 9% of participants were referred to another Department. It was found the 59.6% of participants that were referred back to the Podiatry Department, by the resident Podiatrists, were referred for continuous routine podiatric care.

5.4. FOOT PAIN

The results from this study have identified that a high number (91.8%) of participants that consulted at the various Podiatry Departments in Johannesburg had presented with foot pain. Only 8.2% of the participants reported no foot pain. Those with foot pain reported the pain to occur fairly many times to always in the week prior to their appointment. The majority indicated that they felt a sharp type of foot pain a fair number of times in the week prior to their appointment. The results from this study concur with studies done in Australia, where Hill *et al.* (2008:1), indicated that foot pain affects nearly one in five people. Roddy (2011: np), also reported that foot pain is highly prevalent and that 25% and 15% of older adults suffer from foot and ankle pain on most days respectively.

Comparisons made in this study have highlighted that no differences in foot pain existed between new and follow up patients, in participants who consulted less than five times at the Podiatry Department compared those that had more than five consultations, in participants that had private health insurance compared to those that did not and between genders. It was also interesting to note that there was no correlation found between the participants age and foot pain. Younger and older participants experienced foot pain. However, as highlighted previously, the average age of the sample was 57 years old. There was however, greater foot pain in participants who did not complete a trade certificate or any other educational qualification since leaving school. Interestingly enough, Hill *et al.* (2008:1) and Menz *et al.* (2013: 1281-5) highlight that foot pain is associated with increased age, mainly females, obesity, and pain in other body regions and has a severe negative impact on health-related QoL. However, these authors make mention that foot pain is not only limited to the older population.

Correlations identified in this study found that participants who had greater foot pain had poorer foot function, greater footwear difficulties and a poorer generic health. A study by Menz *et al.* (2013:1281-5), found that mobility limitations in both men and women were significantly associated with foot pain. Roddy (2011: np), reports that foot pain is often related to disabling foot function or locomotor disability. This often leads

to an increased reliance on using vehicular transport, greater difficulty walking and standing, poor balance and an increased risk of falls.

5.5. FOOT FUNCTION

A large number of participants (79.1%) had reported that in the week prior their appointment at the Podiatry Department, the health of their feet had caused slight to extreme limitations or difficulties in work, activities, walking and climbing stairs. The results of this study has highlighted that no differences in foot function was noted between new and follow up participants, the number of follow up podiatric consultations the participant had, whether or not the participant had private health insurance or between gender. However, there were difference noted in participants who did not complete a trade certificate or any other educational qualification since leaving school. It was found that these participants had poorer foot function i.e. greater difficulties or limitations in work, activities, walking or climbing stairs.

The results identified also that those participants with a poorer foot function, interestingly, had more systemic diseases and a poorer generic health. These participants also had a poorer foot health and also greater difficulties in finding shoes that fit and did not hurt their feet and were also limited in the type of shoes that they could wear.

5.6. GENERAL FOOT HEALTH

Although the mean result of how participants rated the health and perceived the general condition of their feet ranged between fair and good, the majority rated the health of their feet (64.9%) and perceived the general condition of their feet (65.8%) as fair or poor. Chapter 4 highlighted the comments that participants made relating to the current state of their feet. From this study that the majority of participants commented about pain related problems of their feet and dermatologically related concerns. The results highlighted that participants who consulted for the first time at the various Podiatry Departments had a poorer general foot health than those that

consulted before. However, it was interesting to note that the general foot health status remained constant regardless of the number of consultations had.

There was no difference in general foot health in participants who completed a trade certificate or any other educational qualification since leaving school, compared to those that had. It was also found that female participants had a poorer general foot health than male participants. This is interesting to note because there seemed to be no correlations identified across gender regarding foot pain or foot function

Many correlations were made in this domain e.g. those participants with a poorer general foot health seemed to have greater foot pain, poorer foot function and poorer generic health. These participants also had greater difficulties in finding shoes that fit and did not hurt their feet and also greater limitation in the type of shoes that they could wear.

5.7. FOOTWEAR

The majority of participants (60.2%) reported that they had great difficulty in finding shoes that did not hurt their feet. More than half of the participants (52%) reported that it was difficult to find shoes that fit their feet and also felt limited in being able to wear a variety of footwear. However, the results of this study have indicated that female participants had greater footwear difficulties and limitations than male participants. A study conducted in the U.S identified that there was no association between foot pain and footwear in male participants and that this could be attributed to the fact that less than 2% of men wore bad footwear (Dufour *et al.*, 2009: 1352-8). An assumption however can be made that there would be equal limitations in footwear in South Africa between male and female participants due to the differences in socio-economic status between South Africa and the USA. A study conducted in Brazil, a country with a similar socio-economic status as South Africa, found that 69.2% of men and 48.5% of women wore incorrectly sized shoes. The study also highlighted that the wearing of inappropriate shoes can lead to biomechanical imbalance, foot problems, foot pain and an increased risk of falls (Paiva de Castro and Rebelatto, 2010: 214-25).

The results of this study have identified that new and follow up participants had similar limitations and difficulties regarding their footwear. It was also noted that no differences were found regardless of the number of consultations had at the various Podiatry Departments. Participants who had completed a trade certificate or any other educational qualification after school had similar footwear difficulties and limitations as those participants that had not.

The results of this study identified that those participants that did not have private health insurance, had greater footwear difficulties and limitations. It can be assumed that an individual without private health insurance may have financial difficulties and cannot afford to purchase appropriate footwear.

Correlations made within this study identified that those participants that had greater footwear limitations and difficulties were older participants who had more systemic diseases and a poorer generic health. These participants also seemed to have greater foot pain, poorer foot function and a poorer general foot health.

5.8. GENERIC HEALTH

The study results have indicated that only a small number of participants (18%) rated their overall health as being good. The majority (82%) rated their health as being fair or poor. It was revealed that the activities that participants felt limited in, due to their health, was mainly when they had to climb a steep hill or walk more than one kilometre. These participants felt that their health impeded less on activities such as carrying or lifting shopping bags, climbing a flight of stairs, getting up from a seated position or grooming themselves. There was approximately an even distribution of participants that believed that their physical health or emotional problems interfered with their normal social activities with friends, family, neighbours or social groups. It was also found that in the 4 weeks prior to the participants' Podiatry consultations, many participants sometimes felt tired, lacked energy and felt worn out. The majority of participants (57.7%) felt that their physical health and emotional problems had interfered with their social activities during the four weeks prior to their Podiatry consultation.

More than half of the participant believed that they were as healthy as anybody they knew, did not feel that they fell ill easier than other people they knew and did not expect their health to deteriorate. However, the majority of participants also did not believe or did not know whether their health was in excellent condition.

The results have concluded that the generic health between new and follow up patients remain the same. It also emerged that the generic health remained the same in participants regardless of the number of Podiatry consultations they've had.

There was no differences found in generic health, in those participants who had not completed a trade certificate or any other educational qualifications since leaving school compared to those that had. No differences were noted in generic health, by the researchers own conclusions as inferential statistics could not be performed due to small group sizes, on those participants that did or did not have private health insurance. Further research would be necessary to ensure more conclusive results.

It was however found that female participants seemed to have a poorer generic health. Many correlations have emerged in this study regarding generic health. It was found that the participants that had a poorer generic health had more systemic diseases. These participants also had greater foot pain, poorer foot function, poorer general foot health and greater difficulties and limitations with their footwear.

5.9. CONCLUSION

This Chapter has highlighted the main themes that have emerged from this study and have discussed the results as represented in Chapter 4. The study has highlighted various comparisons and correlations that seem to exist between foot health status and gender, age groups, socio-economic status and generic health. This Chapter has highlighted that in some areas the results concur with studies that have been done previously, while in certain areas the results do not. It is apparent however, that literature has strongly highlighted that pain is the main reason for patients seeking medical attention. This could hold true for Podiatry as well. From this study the majority

of participants have sought podiatric care due to a painful foot condition. This was regardless of age, gender, socioeconomic status and generic health.



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CHAPTER 6: CONCLUSION

6.1. INTRODUCTION

This Chapter highlights the findings from of this study. As mentioned previously the role of a Podiatrist is to identify, diagnose and treat disorders, diseases and deformities of the feet and lower limbs. A Podiatrist is further responsible for identifying foot health status, educating patients and working within a multidisciplinary team. Foot health is important in maintaining a patient's overall health and well-being. The absence of information and data highlighting foot HRQoL in patients utilizing podiatric services in South Africa, thereby justifying the possible need for and impact of Podiatrists within the public health sector, makes it difficult to argue for the growth and expansion of the profession within the country. A quantitative, non-experimental, descriptive design was selected for this study and aimed to determine the foot HRQoL in patients seen at public health care facilities in Gauteng, South Africa. The results of this study have highlighted that there was a varying degree of foot HRQoL distinction amongst participants consulting at the various Podiatry Departments in Gauteng.

6.2. SUMMARY

It appeared that the majority of participants that consulted at the various Podiatry Departments in Gauteng did not have private health insurance, had not completed further qualifications since leaving school, lived a somewhat sedentary lifestyle and smoked tobacco.

Many authors have alluded to the fact that foot pain is extremely common and leads to people seeking medical advice. Literature has also highlighted that foot pain and poor foot function can have a detrimental effect on a patients' QoL, thereby a negative foo HRQoL. As in this study it was found that the vast majority of patients that had consulted at the various Podiatry Departments around Gauteng have complained of some level of foot pain or limitations in weight-bearing activities, ranging from mild to

extreme pain and disability. These foot pains and poor foot function had affected participants consistently during the period leading up to their Podiatry consultation. It was apparent from this study that a lower education level had greater association with increased foot pain and poorer foot function.

It was apparent that participants felt foot pain and limitations in weight-bearing activities in the period leading up to their Podiatry consultation regardless of whether they had consulted with a Podiatrist before or not, regardless of how many subsequent consults they have had and regardless of whether they had private health insurance or not. Although literature makes mention that older people in general and females are more likely to have foot pain and increased limitations on weight-bearing activities. This study identified that there was no restriction regarding foot pain between genders or through the age categories.

Those with increased foot pain and poor foot function, had greater difficulty with their footwear and seemed to have a poorer generic health. Those with a poorer foot function also seemed to have more systemic diseases and a poor general foot health. However, general foot health was worse in females and in those that were consulting at the Podiatry Department for the first time. It was interesting to note that the general foot health was consistent in those that consulted once compared to those that consulted more than 20 times. Poorer general foot health was correlated to an increased foot pain, poorer foot function, greater difficulty with footwear and poorer generic health.

A large percentage of participants experienced difficulties and limitations with regards to their footwear. Patient education plays a vital role in the overall management of a patient, however, it was apparent that there did not appear to be any difference in footwear difficulties and limitations experienced when comparing new and follow up participants or the number of consultations had. Greater footwear difficulties were experienced in females, those without private health insurance and older participants. Correlations made highlighted that the greater the limitation and difficulty regarding footwear, the older the person, the more systemic diseases they have, the greater their foot pain, the poorer their foot function and the poorer their general foot health.

Females appeared to have a poorer generic health. A poorer generic health appeared to be correlated to more systemic diseases, increased foot pain, poorer foot function, poorer general foot health and greater footwear difficulties and limitations. The most common podiatric diagnoses made was dermatologically related thereby leading to the most common treatment option offered i.e. routine podiatric care. The majority of patients that consulted at the various Podiatry Departments were referred from a Department within that public health care facility, however the Podiatry Departments referred a very small percentage of patients to other departments within that facility. It appeared that the majority of patients consulting at the Podiatry Departments were referred back to the Podiatry Departments for routine podiatric management, thereby explaining the small number of new patients as compared to follow up patients. The Endocrinology Departments appeared to be the Department that most commonly referred patients to the Podiatry Department.

This study also identified that a large number of participants were on prescription medication. The leading conditions that participants were taking prescription medication for at the time of podiatric consultation was hypertension, diabetes mellitus, hyperlipidaemia, osteoarthritis and other musculoskeletal disorders. The study has identified the variations in demographics, diagnoses and treatments offered. It has also given insight in to the referral pathways to and from Podiatry and reasons for these referrals. This has indicated the extent of multidisciplinary teamwork within the current health care structure in Gauteng.

As changes are being made to the country, especially within health care, it is envisaged that the results of this study will contribute towards offering evidence or highlighting the importance or need for Podiatry within the health care system of South Africa. The study produced valuable baseline data and foundational knowledge that will also serve as a valuable resource for further research within the Podiatry profession and may also highlight broadly what influence Podiatry services have had on patients.

6.3. STUDY LIMITATIONS

- The number of health care facilities proved challenging logistically during the data collection process. The researcher could not be present at all the public health care facilities during the data collection process;
- Multiple data collectors lead to a greater difficulty in keeping count and control of the number of questionnaires to be administered on a weekly basis; and
- The language barrier had, in certain instances, led to a misunderstanding of participants towards certain questions within the questionnaire. English, for many participants, was not their first language. This had then had a negative impact on the time taken to administer each questionnaire as data collectors had to spend more time explaining each question.

6.4. RECOMMENDATIONS FOR FUTURE STUDIES

- Further research is needed to expand on each aspect of this study to obtain a more comprehensive outcome regarding foot health status in public health care;
- To expand this study to other parts of South Africa; and
- A comparative study is recommended to determine the foot HRQoL in participants consulting at private podiatric practices.

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FACULTY OF HEALTH SCIENCES
HIGHER DEGREES COMMITTEE

HDC32-01-2012
27 June 2012

TO WHOM IT MAY CONCERN:

Student: PURBHOO, M
Student Number: 809756454

TITLE OF RESEARCH PROPOSAL: Foot health related quality of life of patients utilizing podiatric services at public health care facilities in Gauteng

DEPARTMENT OR PROGRAMME: M.TECH : Podiatry

SUPERVISOR: Prof A Swart CO-SUPERVISOR: Ms H Gosai

The Faculty Higher Degrees Committee has scrutinised your research proposal and confirm that it complies with the approved research standards of the Faculty of Health Sciences; University of Johannesburg.

The HDC would like to extend their best wishes to you with your postgraduate studies.

Yours sincerely,

Prof A Swart (Acting)

Chair: Faculty of Health Sciences HDC



UNIVERSITY
OF
JOHANNESBURG

FACULTY OF HEALTH SCIENCES
ACADEMIC ETHICS COMMITTEE

AEC34-01-2012
20 July 2012

TO WHOM IT MAY CONCERN:

STUDENT: PURBHOO, M
STUDENT NUMBER: 809756454

TITLE OF RESEARCH PROJECT: Foot health related quality of life of patients utilizing podiatric services at public health care facilities in Gauteng

DEPARTMENT OR PROGRAMME: M.TECH : Podiatry

SUPERVISOR: Prof A Swart CO-SUPERVISOR: Ms H Gosai

The Faculty Academic Ethics Committee has scrutinised your research proposal and confirm that it complies with the approved ethical standards of the Faculty of Health Sciences; University of Johannesburg.

The AEC would like to extend their best wishes to you with your postgraduate studies.

Yours sincerely,

Dr R Razlog (Acting)

Chair : Faculty of Health Sciences AEC



MEDICAL ADVISORY COMMITTEE
CHRIS HANI BARAGWANATH ACADEMIC HOSPITAL

PERMISSION TO CONDUCT RESEARCH

Date: 07 August 2012

TITLE OF PROJECT: Foot health related quality of life of patients utilizing podiatric services at public health care facilities in Gauteng, South Africa

UNIVERSITY: Johannesburg

Principal Investigator: Ms M Purbhoo

Department: Podiatry

Supervisor (If relevant): Prof A Swart

Permission Head Department (where research conducted): Not yet

Date of start of proposed study: Aug 2012

Date of completion of data collection: Sept 2012

The Medical Advisory Committee recommends that the said research be conducted at Chris Hani Baragwanath Hospital. The CEO /management of Chris Hani Baragwanath Hospital is accordingly informed and the study is subject to:-

- Permission having been granted by the Committee for Research on Human Subjects of the University of the Witwatersrand.
- the Hospital will not incur extra costs as a result of the research being conducted on its patients within the hospital
- the MAC will be informed of any serious adverse events as soon as they occur
- permission is granted for the duration of the Ethics Committee approval.

Recommended
(On behalf of the MAC)
Date: 07 August 2012

Approved/Not Approved
Hospital Management

Date: 17/08/12



GAUTENG PROVINCE

HEALTH
REPUBLIC OF SOUTH AFRICA

CHARLOTTE MAXEKE JOHANNESBURG ACADEMIC HOSPITAL

Office of the CEO

Enquiries:

Ms. L. Mngomezulu

(011): 488-3793

(011) 488-3753

29th October 2012

Miss Meesha Purbhoo
Department of Podiatry
University of Johannesburg

Dear Miss Purbhoo

RE: "FOOT HEALTH RELATED QUALITY OF LIFE OF PATIENTS UTILIZING PODIATRIC SERVICES AT PUBLIC HEALTH CARE FACILITIES IN GAUTENG, SOUTH AFRICA"

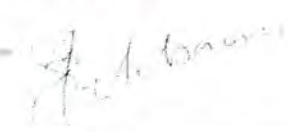
Permission is granted for you to conduct the above research as described in your request provided:

1. Charlotte Maxeke Johannesburg Academic hospital will not in anyway incur or inherit costs as a result of the said study.
2. Your study shall not disrupt services at the study sites.
3. Strict confidentiality shall be observed at all times.
4. Informed consent shall be solicited from patients participating in your study.

Please liaise with the Head of Department and Unit Manager or Sister in Charge to agree on the dates and time that would suit all parties.

Kindly forward this office with the results of your study on completion of the research.

Yours sincerely



Dr. T.E. Selebano
Chief Executive Officer



GAUTENG PROVINCE

HEALTH
REPUBLIC OF SOUTH AFRICA

OFFICE OF THE CEO

Dr. A. Naidoo

Tambo Memorial Hospital

☎ : (011) 898-8317

☎ : (011) 892-0358

✉ : AvisN@gpg.gov.za

MEMO

To : Ms. M. Purboo
From : Dr. A. Naidoo
Date : 6 August 2012
Subject : **Request to Carry Out Research at Tambo Memorial Hospital**

This serves to grant permission to Meesha Purboo to carry out a research study at Tambo Memorial Hospital for the purpose of completing her Maters in Technology Degree. This permission is granted in light of improving the skill capacity of the Gauteng Department of Health.

The permission is granted in line with the code of ethics or research.

The information of the Gauteng Health Department will be used for the purpose of research and it will be utilized discreetly and that confidentiality will be maintained at all times.

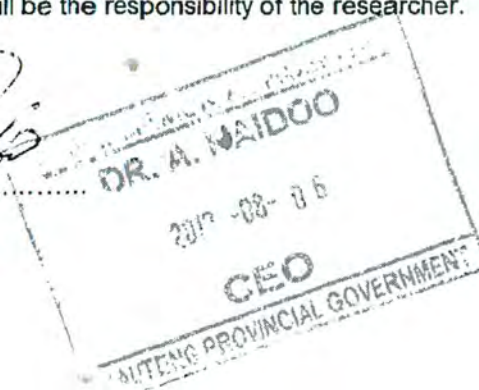
The permission is granted in good faith with the notion and understanding that the abovementioned clause is upheld.

Furthermore, there should be no financial implication to the hospital.

The collection of data will be the responsibility of the researcher.

Thank you,

Dr A Naidoo
Chief Executive Officer





GAUTENG PROVINCE
REPUBLIC OF SOUTH AFRICA



RAHIMA MOOSA MOTHER AND CHILD HOSPITAL

Enquiries: Mrs. S. Jordaan
Tel: (011) 470 – 9030/4
Fax: (011) 477 4117

University of Johannesburg
P.O. Box 524
Auckland Park
2006

Re: "Foot Health related quality of life of patients utilizing podiatric services at Public Health Care facilities in Gauteng"

Dear Ms. Meesha Purbhoo,

Permission is granted for you to conduct the above survey as indicated in your request:

1. The Rahima Moosa hospital will not in anyway incur or inherit costs as a result of the said study.
2. Your study shall not disrupt services at the study site.
3. Strict confidentiality shall be observed at all times.
4. Informed consent shall be solicited from patients participating in your study.
5. NO file should leave the records department and/or the hospital premises.

Arrangement will be made with recordkeeping clerks so that you could occupy space in their department.

Kindly forward this office with the results of your research on completion of it.

I, M. Purbhoo accept the terms and conditions set-in this document

sign [Signature] date 22/10/2012

Yours sincerely,

[Signature]
CHIEF EXECUTIVE OFFICER
SJ/cj. 2012-09-27

ADDRESS: cnr. FUEL & OUDSTROOM STREET CORONATIONVILLE 2093/PRIVATE BAG X20 NEWCLARE 2112



health and social development

Department: Health and Social Development
GAUTENG PROVINCE

PERMISSION FOR RESEARCH

DATE: 8/11/12

NAME OF RESEARCH WORKER: Miss Meesing Parbhoo

CONTACT DETAILS OF RESEARCH (INCLUDE ALTERNATE RESEARCHER):

(011) 559 3402 or 084 663 6461

TITLE OF RESEARCH PROJECT Foot health related quality of life of patients Utilizing podiatric services at public health care facility in Gauteng, South Africa.

OBJECTIVES OF STUDY (Briefly or include a protocol): See attached protocol page 8.

METHODOLOGY (Briefly or include a protocol): See attached protocol page 9.

THE APPROVAL BY THE SUPERINTENDENT IS STRICTLY ON THE BASIS OF THE FOLLOWING:

- (i) CONFIDENTIALITY OF PATIENTS MAINTAINED: Yes
- (ii) NO COSTS TO THE HOSPITAL: No
- (iii) APPROVAL OF HEAD OF DEPARTMENT: Dr D. Letswalo.
- (iv) APPROVAL BY ETHICS COMMITTEE OF UNIVERSITY: Yes

SUPERINTENDENT PERMISSION

Signature: [Signature] Date: 08/11/12

SUBJECT TO ANY RESTRICTIONS: _____



To: Miss Meesha Purbhoo
From: Dr. G. Bulela
Date: 31st October 2012
RE: PERMISSION TO CONDUCT RESEARCH

The Clinical Department of Alexandra Health Centre and University Clinic has analyzed your request to conduct the study on "foot health related quality of life of patients utilizing podiatric services at Public Health care facilities in Gauteng, South Africa". And has found it relevant, therefore, you are allowed to come and conduct the above mentioned study.

Yours Sincerely

Dr. G. Bulela

Senior Doctor/ Alexandra Health Centre

UNIVERSITY
OF
JOHANNESBURG



a world class African city

ENQUIRIES: C. Trase
Tel: +27(0) 11 407 4037
Fax: +27(0) 11 407 8840

4th Floor B Block
Metropolitan Centre
158 Loveday Street
Braamfontein

PO Box 91244
Braamfontein
South Africa
2017

Tel: +27(0) 11 407 7613
Fax: +27(0) 11 339 2066

7 January 2013

Dear Ms. Purbhoo

**APPROVAL TO CONDUCT RESEARCH WITHIN HEALTH IN
THE CITY OF JOHANNESBURG**

Permission has been granted to you to conduct research in the Health Department within the City of Johannesburg.

**Topic: Foot health related quality of life of patients utilizing
Podiatric Services at Public Health Care facilities
In Gauteng, South Africa.**

Please contact the following person(s) before you commence with your project and to gain access to the clinics:

Region	Regional Health Manager	Contact No.	Cell phone
B	Ms Paulinah Maepa	011 718 9656	082 551 5804

Should you have any queries please do not hesitate to contact our department.

We look forward to your Final Research Report.

Thank you


DR. R. BISMILLA
Executive Director
City of Johannesburg
Health Department



PARTICIPANT PODIATRIST INFORMATION AND CONSENT FORM

Dear Podiatrist

I, Meesha Purbhoo, is inviting you to participate in the data collection process of my research, in fulfillment of completion of a Masters in Technology Degree at the University of Johannesburg, South Africa. The title of my study is "FOOT HEALTH RELATED QUALITY OF LIFE OF PATIENTS UTILIZING PODIATRIC SERVICES AT PUBLIC HEALTH CARE FACILITIES IN GAUTENG, SOUTH AFRICA". This study aims to measure foot health related quality of life of patients utilizing podiatric services at various health care facilities in Gauteng, South Africa, in order to increase the evidence base for this area of health care.

Your participation in the study is totally voluntary and you may withdraw at any stage. Your name will not appear on any of the forms required for data collection. Data collection over an eight week period or until the required proportionate representative sample size is reached. Data collection would need to be carried out on all consenting Podiatry outpatients consulting with you, at the healthcare facility that you are based. Each patient will be required to complete a consent form prior to you completing the questionnaire.

You may contact me at any stage during the process should you require any clarification.

Sincerely

Meesha Purbhoo (011 559 6442 or meeshap@uj.ac.za)

(Podiatrist, B.Tech (POD) SA)

Supervisor: Prof Andre Swart (011 559 6224 andres@uj.ac.za)



CONSENT FORM FOR PARTICIPANT PODIATRISTS

Dear Researcher

I, (Name Surname),....., Podiatrist, consulting at (place)....., agree to participate in the data collection process of your research, in fulfillment of a Masters in Technology degree at the University of Johannesburg titled "FOOT HEALTH RELATED QUALITY OF LIFE OF PATIENTS UTILIZING PODIATRIC SERVICES AT PUBLIC HEALTH CARE FACILITIES IN GAUTENG, SOUTH AFRICA"

1. I understand that I will be required to complete the questionnaire on each consenting Podiatry out-patient at the healthcare facility where I am based over an eight week period or until the required proportionate representative sample size is reached.
2. I understand that each patient will be required to complete a consent form before I complete a questionnaire.
3. I understand that I am free to withdraw from the study at any stage.
4. I understand that my name will not appear on any of the data collection sheets.
5. I understand that other than the consent forms patient confidentiality will be maintained at all times.

.....
Participant Signature

.....
Date

.....
Witness Signature

.....
Date



PARTICIPANT PATIENT INFORMATION AND CONSENT FORM

Dear Patient

I, Meesha Purbhoo am inviting you to participate in my research, in fulfillment of the requirements of a Masters in Technology Degree at the University of Johannesburg. The title of my study is "FOOT HEALTH RELATED QUALITY OF LIFE OF PATIENTS UTILIZING PODIATRIC SERVICES AT PUBLIC HEALTH CARE FACILITIES IN GAUTENG, SOUTH AFRICA"

This study aims to measure foot health related quality of life of patients utilizing podiatric services at public health care facilities in Gauteng, in order to increase the evidence base for this area of health care.

Your participation in the study will remain strictly confidential as your name will not appear on any of the forms required for data collection, and you may withdraw from the study at any point if so desired. The data collection process will not cause you any harm and involves your podiatrist completing a questionnaire once you have consented to participate. The questionnaire will take approximately 15 minutes to complete and you will be required to answer some questions relating to the problems you are experiencing with your general health, your feet and lower limbs.

Your podiatrist will provide you with further clarification if need be.

Thank you

Sincerely

Meesha Purbhoo (Podiatrist, B.Tech (Pod) SA)



CONSENT FORM FOR PARTICIPANT PATIENTS

Dear Researcher

I, (Name Surname),....., at (place).....
....., agree to participate in your
research, in fulfillment of a Masters in Technology degree at the University of
Johannesburg titled "FOOT HEALTH RELATED QUALITY OF LIFE OF PATIENTS
UTILIZING PODIATRIC SERVICES AT PUBLIC HEALTH CARE FACILITIES IN
GAUTENG, SOUTH AFRICA"

1. I understand that I will be required to answer questions asked by my podiatrist relating to my health and the problems I am experiencing with my feet or lower limbs.
2. I understand that I am free to withdraw from the study at any point.
3. I understand that my participation in this study will remain strictly confidential as my name will not appear on any of the data collection sheets.
4. I understand that participation in this study will not cause me any harm.
5. I understand by signing this consent form, I am agreeing to partake in this study.

.....
Participant Signature

.....
Date

.....
Witness Signature

.....
Date

THE FOOT HEALTH STATUS QUESTIONNAIRE



Thank you for taking the time to fill out this important questionnaire.

The answers you provide will help your podiatrist to understand how to care for your foot problems.

The questionnaire is very simple to complete and there are no right or wrong answers. The questionnaire takes less than 10 minutes to complete.

The Foot Health Status Questionnaire

INSTRUCTIONS

- This questionnaire asks for your views about your foot health.
- All you need to do is circle your answer to each question.
- If you are unsure about how to answer a question, please give the best answer you can.

The following questions are about the foot pain you have had during the past week.

1. What level of foot pain have you had during the past week ?
(circle number)

None.....	1
Very Mild.....	2
Mild.....	3
Moderate.....	4
Severe.....	5

(circle a number for each question below)

<u>DURING THE LAST WEEK...</u>	Never	Occasionally	Fairly Many Times	Very Often	Always
2. How often have you had foot pain ?	1	2	3	4	5
3. How often did your feet ache?	1	2	3	4	5
4. How often did you get sharp pains in your feet ?	1	2	3	4	5

These questions are about how much your feet interfere with activities you might do during a typical day.

(circle a number for each question below)

DURING THE LAST WEEK.....

	Not at All	Slightly	Moderately	Quite a bit	Extremely
5. Have your <u>feet</u> caused you to have difficulties in your work or activities ?	1	2	3	4	5
6. Were you limited in the kind of work you could do because of your <u>feet</u> ?	1	2	3	4	5

DURING THE LAST WEEK...

	Not at All	Slightly	Moderately	Quite a bit	Extremely
7. How much does your <u>foot health</u> limit you walking ?	1	2	3	4	5
8. How much does your <u>foot health</u> limit you climbing stairs ?	1	2	3	4	5

9. How would you rate your overall foot health ? (circle number)

- Excellent..... 1
- Very Good..... 2
- Good..... 3
- Fair..... 4
- Poor..... 5

Please turn to the next page

The following questions are about the shoes that you wear. Please circle the response which best describes your situation.

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
10. It is hard to find shoes that do not hurt my feet.	1	2	3	4	5
11. I have difficulty in finding shoes that fit my feet.	1	2	3	4	5
12. I am limited in the number of shoes I can wear.	1	2	3	4	5

13. In general, what condition would you say your feet are in ?

(circle number)

Excellent..... 1

Very Good..... 2

Good..... 3

Fair..... 4

Poor..... 5

Please write some comments about the current state of your feet:

.....

.....

.....

.....

.....

14. In general, how would you rate your health :

(circle number)

- Very Good..... 1
 Fair..... 2
 Poor..... 3

15. The following questions ask about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

(circle a number on each line)

<u>ACTIVITIES</u>	Yes, Limited A Lot	Yes, Limited A Little	No, Not Limited At All
a. Vigorous activities , such as running, lifting heavy objects, or (if you wanted to) your ability to participate in strenuous sports	1	2	3
b. Moderate activities , such as cleaning the house, lifting a chair, playing golf or swimming	1	2	3
c. Lifting or carrying bags of shopping	1	2	3
d. Climbing a steep hill	1	2	3
e. Climbing one flight of stairs	1	2	3
f. Getting up from a sitting position	1	2	3
g. Walking more than a kilometre	1	2	3
h. Walking one hundred meters	1	2	3
i. Showering or dressing yourself	1	2	3

16. This next question asks to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours or social groups?

(circle number)

- Not at all..... 1
 Slightly..... 2
 Moderately..... 3
 Quite a bit..... 4
 Extremely..... 5

Please turn to the next page

17. These questions are about how you “feel” and how things have been with you during the past month. For each question, please give the one answer that comes closest to the way you have been “feeling”. How much of the time during the past 4 weeks:

	All of the time	Most of the Time	Some of the Time	A little of the Time	None of the Time
a. Did you feel tired?	1	2	3	4	5
b. Did you have a lot of energy?	1	2	3	4	5
c. Did you feel worn out?	1	2	3	4	5
d. Did you feel full of life?	1	2	3	4	5

18. During the past 4 weeks, how much of the time has your emotional problems or physical health interfered with your social activities (like visiting with friends, relatives, etc.)?

(circle number)

- No time at all..... 1
- A small amount of time..... 2
- Moderate amount of time..... 3
- Quite a bit of the time..... 4
- All of the time..... 5

19. How TRUE or FALSE is each of the following statements for you?

(circle a number on each line)

	True or Mostly True	Don't Know	False or Mostly False
a. I seem to get sick a little easier than other people	1	2	3
b. I am as healthy as anybody I know	1	2	3
c. I expect my health to get worse	1	2	3
d. My health is excellent	1	2	3

Please complete the following details.

20. Full Name: _____

21. Address: _____ Postcode: _____

22. Date of Birth: _____ Sex: Male Female

23. What is the date when you filled out this survey? Please write here → _____

24. Do you currently take any medicine prescribed by your doctor for any of the following conditions ;

(please tick the appropriate box/s)

- | | | | |
|----------------|--------------------------|-----------------------------|--------------------------|
| Diabetes | <input type="checkbox"/> | Hormone Replacement Therapy | <input type="checkbox"/> |
| Osteoarthritis | <input type="checkbox"/> | High Cholesterol | <input type="checkbox"/> |
| Blood Pressure | <input type="checkbox"/> | Rheumatoid Arthritis | <input type="checkbox"/> |
| Heart Disease | <input type="checkbox"/> | Back Pain | <input type="checkbox"/> |
| Lung Disease | <input type="checkbox"/> | Depression | <input type="checkbox"/> |

Any other conditions you take _____ 1.
medicine for, please list 2.
3.

For the next questions, please tick either **YES** or **NO**

- | | Yes | No |
|--|--------------------------|--------------------------|
| 25. Are you a pensioner or health care cardholder ? | <input type="checkbox"/> | <input type="checkbox"/> |
| 26. Do you smoke cigarettes ? | <input type="checkbox"/> | <input type="checkbox"/> |
| 27. Do you do any regular physical exercise ? | <input type="checkbox"/> | <input type="checkbox"/> |
| 28. Do you have private health insurance ? | <input type="checkbox"/> | <input type="checkbox"/> |
| 29. Have you completed a trade certificate or any other educational qualification since leaving school ? | <input type="checkbox"/> | <input type="checkbox"/> |

**Thank you for completing this
questionnaire**



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SECTION B: QUESTIONNAIRE

30. New patient
31. Follow up patient
32. If the patient is a follow up patient, how many subsequent follow up consultations has this patient had?

<5 6-10 11-20 >20

33. Provide an approximate time period since patients last visit:

1-2 months ago 3-5 months ago 6-12 months ago >1yr ago

34. What is/are your podiatric diagnosis/diagnoses for this patient?

ICD 10 code/s : _____

35. What management/ treatment did you offer this patient?

(please tick)

- | | |
|--|---|
| Routine Podiatric care <input type="checkbox"/> | Padding and Strapping <input type="checkbox"/> |
| Drug Prescription <input type="checkbox"/> | Minor Surgical Procedure <input type="checkbox"/> |
| Orthotic management <input type="checkbox"/> | Simple Innersole Management <input type="checkbox"/> |
| X-Ray referral <input type="checkbox"/> | Laboratory Investigation referral <input type="checkbox"/> |
| Footwear advice <input type="checkbox"/> | General foot and lower limb advice <input type="checkbox"/> |
| Wound management/redressing <input type="checkbox"/> | Injections <input type="checkbox"/> |
| Referral <input type="checkbox"/> | Other <input type="checkbox"/> |

If you ticked "Other", please specify any other managements/ treatments you offered this patient :

- A: _____
- B: _____
- C: _____
- D: _____

36. Please specify in the table below where the patient was referred from, referred to and the reasons for these referrals:

36a.

Referred From:	Reason/s for Referral to you
Another Department/ Other <input type="checkbox"/> Specify _____ Self <input type="checkbox"/>	

36b.

Referred To:	Reason/s for Referral by you
Another Department/ Other <input type="checkbox"/> Specify _____ Back to Podiatry <input type="checkbox"/>	

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