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Knowledge, attitudes and practices of central Gauteng occupational health nurse practitioners related to travel health and medicine

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KNOWLEDGE, ATTITUDES AND PRACTICES OF CENTRAL GAUTENG OCCUPATIONAL HEALTH NURSE PRACTITIONERS RELATED TO TRAVEL HEALTH AND MEDICINE

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A research report submitted to the Faculty of Health Sciences,
University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirement for the degree

Master of Science in Nursing

February 2016

DECLARATION

I, Lynette Ann Botha, declare that the Research Report on "**Knowledge, Attitudes and Practices of Central Gauteng Occupational Health Nurse Practitioners related to Travel Health and Medicine"** is my original work in design and execution, and that all sources cited have been duly acknowledged. It has not been submitted before for any degree or examination at any other university.

…… ……

Signature Date

Protocol number: M150233

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DEDICATION



This work is dedicated to very special people in my life:

My parents, Mike and Ann Kemp

You always believed in me

I miss you both

My brother, André Kemp for all the positive encouragement.

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📖 Mary Ross. My heartfelt gratitude. You planted a seed that helped a dream come true and you were there every step of the way.

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ABSTRACT

Background: Travel medicine (TM) is fast becoming an interdisciplinary speciality that is required for all medical and nursing practitioners. To facilitate comprehensive nursing care to a community of workers, in workplace settings where workers are required to travel, the occupational health nurse practitioner (OHNP) should be able to provide travel health education and guidance.

Purpose and objective: The purpose of this study was to investigate the knowledge, attitudes and practices of Occupational Health Nurse Practitioners (OHNPs) related to travel health and medicine. The objective of the study was to describe the knowledge, attitude and practices of OHNPs related to travel health and medicine, in the Central Gauteng district, including the Vaal Triangle and West Rand.

Research design and method: The study was a quantitative, descriptive survey. The survey design was cross sectional using a structured, open and closed ended, self-administered questionnaire that was designed by the researcher using Research Electronic Data Capture Software, version 6.9.5 (REDcap).

Data Analysis: Descriptive statistics were used to analyse the data. Statistical assistance was obtained from a biostatistician from the Medical Research Council in Pretoria. Data were analysed by using the Data Analysis and Statistical Software Version 13 software (STATA) and presented in tables. Categorical data was presented using frequencies (counts) and percentages.

Findings: No hypothesis was formulated for the study because the outcomes were not predictable. The study was guided by specific research questions that confirmed leisure, occupational travel and migration was increasing, leading to the rapid spread of disease. OHNPs indicated that the inclusion of travel medicine in the OHN curricula was important.

Conclusions: In view of the fact that limited research has been done in the South African context on the knowledge, attitudes and practices of the OHNPs related to travel health and medicine, the researcher embarked on this research endeavour to investigate the knowledge, attitudes and practices of OHNPs within their OH practice. Provision of travel medicine services is a future role for OHNPs as it forms part of a comprehensive wellness/health promotion programme.

Key words: Occupational Health Nurse, Travel Medicine.

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NOMENCLATURE

ISTM	International Society of Travel Medicine
MRC	Medical Research Council
NDoH	National Department of Health
OHNP	Occupational Health Nurse Practitioner
OHN	Occupational Health Nurse
OMP	Occupational Medicine Practitioner
RSA	Republic of South Africa
SASOHN	South African Society of Occupational Health Nurses
SASTM	South African Society of Travel Medicine
THNs	Travel Health Nurses
WHO	World Health Organization
WHP	Workplace Health Promotion

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CHAPTER ONE

ORIENTATION TO THE STUDY

> "You can travel from a remote village in Congo to New York or Tokyo in 24 hours. From the perspective of infectious agents, the whole world is now one village. Individuals infected almost anywhere have the potential to seed pandemics everywhere." (Wolfe, 2014)

1.0 INTRODUCTION

This chapter provides an orientation to the study. It is within a comprehensive occupational health nursing and workplace health management framework that this study investigated the knowledge, attitudes and practices of occupational health nursing practitioners related to travel health and medicine. In addition, the nature and extent of travel medicine services offered in the industries/businesses in which Gauteng occupational health nurse practitioners practice was determined.

The roles and activities of occupational health nurse practitioners (OHNPs) are expanding to meet the ever-changing needs and challenges of the globalised 21st century workplaces and workers. Travel health promotion is an expanding role within the health promoter and educator roles.

1.1 BACKGROUND TO THE RESEARCH

Globalisation and transportation currently create unprecedented opportunities for disease to spread exponentially. Many international and local industries and companies require workers to travel locally and globally as part of their work. Travel clinics provide a service to tourists and occupational travellers.

Traditionally travel health services are rendered in special dedicated travel clinics by travel health nurses and medical practitioners. Travel health nurses (THNs) consider all aspects of travel health care in order to help the traveller prevent and manage injury and illness abroad and on their return. However, travel clinics are usually available only in urban areas. Circumstances, including work pressure and costs, dictate that it is not always feasible for employees to visit travel clinics.

Some corporates and multinational companies such as the mining, banking and telecommunications industries do provide a travel medicine service to their employees. This service is managed by the OHNP and the occupational medical practitioner (OMP) who is trained in travel medicine.

According to the American Travel Health Nurses Association (ATHNA) (2015), each year millions of people travel internationally for work, pleasure, study or humanitarian efforts and that number continues to grow. The United Nations World Tourism Organisation estimates that business and professional travellers make up 15% of travellers (UNWTO, 2010). Included in those who travel are high risk travellers, such as diabetics; the immuno-compromised; those with cardiovascular, renal, neurological, gastrointestinal, malignant and other disorders; individuals with psychological and psychiatric illnesses; pregnant women; children; the elderly; and people with disabilities.

The health risks of international travel vary and depend upon multiple factors such as age, destination, duration and season of travel, trip accommodations, trip activities, and the underlying health of the traveller (ATHNA, 2015).

Travel medicine is a relatively new speciality which was initially derived from infectious diseases and tropical medicine. It emerged in 1988 when the first conference in travel medicine was held in Zurich, Switzerland. In 1991 the International Society of Travel Medicine (ISTM) was formed at the Atlanta conference and nowadays over 2000 participants from 65 countries attend the bi-annual ISTM conference. The speciality now encompasses amongst others primary care, wilderness medicine, occupational medicine, migrant medicine and international health (ISTM, 2014).

In South Africa formal education in travel medicine commenced in 2000. Presented by multidisciplinary teams of local health practitioners, the course falls under the umbrella of the School of Public Health at the University of the Witwatersrand with input from the James Cooke University School of Public Health and Tropical Medicine. The South African Society of Travel Medicine (SASTM) was also established in 2000.

International literature and local experience confirms that there is a need for training in travel medicine and this includes OHNPs to provide pre and post care to their patients and/or clients (Ross, 2001). Evaluation of the first five years of the travel medicine course indicated that the 394 course registrants mainly comprised medical (60%) and nurse practitioners (33%) but it did not measure what proportion were occupational health practitioners (Ross, et al, 2005).

Patel, in her 2011 review of occupational travel, presented epidemiological data from studies done between 1980 and 2010. A few studies have been done on the health of travellers; however, the understanding of the epidemiology of travel and related diseases is limited. Studies were mostly focussed on travel to tropical destinations and illnesses that were self-reported by returning travellers. No exact numbers are available on travellers to specific destinations or cases of illness and injury reported. Thus the estimation of disease risk in travellers is elusive (Patel, 2011).

1.2 MOTIVATION AND RATIONALE FOR THE STUDY

The researcher is an OHNP with certification in travel medicine who delivers a travel health service in conjunction with an occupational medicine practitioner (OMP) in a mining company. She therefore has an interest in travel health within the occupational context and questioned to what extent occupational health nurse practitioners and occupational health services deliver travel health and medicine services. She furthermore wished to study the knowledge, attitudes and practices of OHNPs regarding travel medicine.

In South Africa employees come from other continents, other African countries, and provinces within South Africa, to work as permanent or contract employees, which could imply that they are occupational travellers. Being knowledgeable of diseases that are endemic in host countries or seasonally prevalent would facilitate prompt diagnosis and appropriate interventions that will save time and enhance health outcomes if assessed by the OHNP on site.

During the last two decades, the challenges facing the occupational health community globally with respect to travel-related issues, such as the emergence and re-emergence of infectious diseases, have increased (World Health Organisation,

2014). Short and long-term travel for work has become a necessity as business expands globally, particularly into the rest of Africa. Globally, migration has increasingly become a defining feature of our contemporary world. Travel medicine is fast becoming an interdisciplinary speciality that is required for all medical and nursing practitioners (Ross, 2001).

To facilitate comprehensive nursing care to a community of workers in workplace settings where workers are required to travel, the occupational health nurse practitioner should be able to provide travel health advice, education and services (Rosselot, 2004). In order to provide a comprehensive occupational health service to workers or employees it is essential that the OHNPs and OMPs offer travel health and medicine as part of a workplace health management programme.

The significance of this study lies in the fact that very limited research has been done nationally and internationally on travel medicine within OHN.

The researcher was motivated by the following considerations:

- To determine the knowledge, attitudes and practices of Gauteng OHNPs to travel health and medicine.
- It is currently not known to what extent travel health services, as part of occupational health, are rendered by industries in Gauteng.
- The South African Society of Occupational Health Nurses (SASOHN) and SASTM have no data on how many occupational health nurse practitioners are qualified to practise travel medicine. The travel medicine certificate is not recognised as an additional qualification with the South African Nursing Council (SANC) and therefore no statistics are available.
- The research can contribute to the body of knowledge of OHNPs with respect to travel medicine within the occupational health industry.
- Literature revealed that limited research has been done in South Africa, Africa and internationally with regard to travel medicine within the occupational health environment and the occupational traveller in particular, but did however indicate a growing trend in travel health globally.

- This study can support and facilitate development of OHNPs in the field of travel medicine. The information is aimed at adding value to the provision of travel health advice to OHNPs who are currently working in the field of occupational health.
- The result of this study may be of benefit to the inclusion of a travel medicine introduction when training new occupational health nurses.
- This study can be a motivator for similar and other very necessary research in the field.
- It is envisaged that this study will provide information to consider when re-curriculation takes place.

1.3 RESEARCH PROBLEM AND QUESTIONS

Tatem, Rogers and Hay (2006) suggest that the major contributing factor to the rapid spread of disease is the modern transport system, coupled with the growth of tourism and increased numbers of employees travelling for work purposes. It is known that occupational travel is increasing, however, little evidence was found in international and national literature on travel health and medicine in occupational health nursing practice and in occupational health in general. The challenge then for this study is that the knowledge, attitude and practices of OHNPs related to travel health and medicine are not known. In addition, the SASOHN and the SASTM have no data on how many occupational health nurses are qualified to practise travel medicine, and it is currently not known to what extent travel health services, as part of occupational health, are rendered by industries in Gauteng.

The research is subsequently aimed at answering the following research questions:

- What is the extent of the knowledge, attitudes and practices of OHNPs in the Central Gauteng SASOHN district related to travel medicine?
- What are the nature and the extent of travel health practice within occupational health services in the Central Gauteng district?

1.4 PURPOSE AND OBJECTIVES OF THE RESEARCH

The overall purpose of this research was to investigate the knowledge, attitudes and practices of OHNPs who are currently employed in the Central Gauteng SASOHN

district of South Africa. In addition, the study aimed to investigate the nature and extent of travel medicine services within occupational health services.

In order to achieve the purpose of the research the following research objectives motivated this research:

- To describe the knowledge, attitudes and practices of OHNPs related to travel medicine.
- To determine the nature and extent of travel medicine provided by OHNPs in their respective workplaces.

1.5 DEMARCATION OF THE RESEARCH

The research was limited in terms of the following criteria:

- ***Research setting***: The research study was limited to OHNPs working in the Central Gauteng district in South Africa that includes the Vaal Triangle and West Rand branches of the SASOHN.
- ***Population*****:** The target population consisted of OHNPs registered on the SASOHN database in Central Gauteng, as it was not feasible to include all OHNPs. Most companies with international workers are likely to be based in Gauteng.
- ***Employee category*****:** The research was limited to professional nurse practitioners working in the occupational health setting.
- ***Instrument*****:** As there was no research instrument available, a closed and open self-administered questionnaire was developed by the researcher.
- ***Time*****:** The research was a cross-sectional survey study, which was conducted between May and July 2015.

1.6 RESEARCH METHOD AND DESIGN

The study was a quantitative, cross-sectional survey using a structured, self-administered questionnaire with closed and open ended questions developed by the researcher since no questionnaire of this nature was available elsewhere.

No hypothesis was formulated for the study because the outcomes were not predictable. The study was guided by specific research questions. The survey method was chosen for this study so as to enable the researcher to collect data systematically and in an objective manner in order to attain answers to the research questions.

A detailed description of the research method and design is provided in Chapter 3 and includes an explanation of the research design used, the decision around the research setting and target population. As part of the research method, the sampling methods, size and procedure will be discussed in full, as well as the criteria and specifications of the data collection instrument used for the particular research.

1.7 CLARIFICATION OF CONCEPTS USED IN THIS STUDY

For the purpose of this study it is appropriate to define the following concepts:

1.7.1 KAP Survey

According to Gumucio (2011) a KAP survey means **K**nowledge, **A**ttitudes and **P**ractices. “To properly carry out this type of survey it is important to establish a basic premise and provide definitions for each word.

- **K:** Knowledge is a set of understandings, knowledge and of “science.” It is also one’s capacity for imagining, one’s way of perceiving. In this case knowledge of health behaviour.

- **A:** Attitude is a way of being, a position. These are leanings or tendencies.

- **P:** Practices or behaviours are the observable actions of an individual in response to a stimulus. This is something that deals with the concrete, with actions” (Gumucio, 2011).

1.7.2 Occupational Health Nurse Practitioner (OHNP)

A registered professional nurse with a post graduate qualification in Occupational Health Nursing. The OHNP possesses the specialised knowledge and skills to carry

out the aims of protecting and promoting the health of employees in the workplace (Acutt & Hattingh, 2011).

1.7.3 Occupational Medicine Practitioner (OMP)

A medical practitioner with a post graduate qualification in occupational medicine that is recognised as such by the South African Medical and Dental Council.

1.7.4 Travel Medicine

“It is that aspect of public health medicine which seeks to prevent injury and illness occurring to travellers and manages any problems arising in returning travellers at home or coming from elsewhere” (Leggat, Ross & Goldsmid, 2002).

1.7.5 Travel Health

“Expert advice that is destination specific with regards to health risks and preventative measures, given by a qualified travel health nurse” (Travel Medicine and Vaccination Centre, 2014).

1.8 OUTLINE OF THE STUDY

This research report is presented in the following chapters:

Chapter 2: Literature review

This chapter deals with the literature that was reviewed relevant to the topic and study. Concepts are clarified; the nature, importance and extent of travel health and medicine are discussed; and the effects of travel on health and global disease trends are considered. In addition, the roles of the OHNP and travel health within occupational health are described.

Chapter 3: Research design and method

Chapter 3 focuses on the description of the research design and the method that were used to determine the knowledge, attitudes and practices of OHNPs. The chapter describes and explains the research method and provides an overview of the problem, assumptions, research question and ethical issues of the study. The development of the measurement instrument, the method of data collection and the

sampling process are explained and justified. In addition, ethical considerations and measures taken to protect the rights of the research participants are presented.

Chapter 4: Results and discussion of findings

In this chapter the analysis and presentation of the findings are given in detail. A demographic profile of the sample is provided and the validity and reliability of the study is discussed. The data are analysed and linked in answering the research questions and compared with the research assumptions made. The discussion on the research findings is also provided in this chapter.

Chapter 5: Summary, conclusions, recommendations and proposals

This chapter provides answers to the research questions and conclusions on the findings of the study. The limitations of the study are described and the recommendations based on the findings of the study are made in respect of occupational health nursing practice and research, and future research in general.

1.9 SUMMARY

Chapter 1 presented an introductory orientation and background to this research and stated the rationale and significance of the problem on the unknown level of knowledge, attitudes and practices of OHNPs working in occupational health services in South Africa. The purpose and objectives of the research, as well as the research questions and assumptions were clarified in this chapter. The following chapter presents the literature review done by the researcher that articulates the theoretical framework of this study.

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

This Chapter focuses on the discussion of the literature consulted relevant to the study.

To enable the researcher to execute this research project, and facilitate an understanding and acquire knowledge of the subject matter, an extensive literature review was undertaken on various aspects pertaining to the topic. The following sources provided valuable information for the literature review: textbooks, journal articles, internet sources, policies and acts of parliament, and fact sheets from the World Health Organization (WHO). In addition, the International Society of Travel Medicine (ISTM) and the South African Society of Travel Medicine (SASTM) also provided valuable information. Internet sources included PubMed and Journal of Travel Medicine. Search terms used where travel medicine, occupational health, occupational health nursing and travel medicine, disease trends related to travel.

2.1 TRAVEL MEDICINE AND TRAVEL HEALTH: A CONCEPTUAL ANALYSIS

To arrive at a description of the concepts of travel medicine and health, the meaning of the five concepts are examined in the section below.

2.1.1 Meaning of travel

Travel is the act of going from one place to another for the purpose of work or vacation. Travel can be undertaken by means of air travel, boat (by sea), walking, rail, cycling and/or by motor vehicle (AudioEnglish, 2015).

2.1.2 Meaning of medicine

Medicine is the science related to the prevention, cure or alleviation of disease and/or injury. It includes the administration of a remedial agent or remedy (Webster Dictionary, 2015).

2.1.3 Meaning of health

The World Health Organization in 1946 defined health as "a state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity". A number of factors are known to influence the health of individuals, including background, lifestyle, and economic and social conditions" (WHO, 1948).

2.1.4 Meaning of travel health

According to the Travel Medicine and Vaccination Centre (TMVC) website travel health can be defined as expert advice that is provided by a qualified travel health nurse or doctor which is destination specific with regards to health risks and preventative measures. This also includes physical fitness to travel and work under expatriate conditions (Travel Medicine and Vaccination Centre, 2014).

2.1.5 Meaning of travel medicine

"The branch of medicine that specialises in diseases and conditions that are acquired during travel. Travellers to different countries should be aware of the potential for acquiring diseases and injury which are not common in their own country. Immunizations, preventative medications, and general precautions should be considered prior to trips to different parts of the world" (MedicineNet, 2015).

2.2 NATURE AND IMPORTANCE OF TRAVEL HEALTH AND MEDICINE

The need for travel medicine (TM) emerged in 1988 when it became apparent that leisure and occupational travel was expanding rapidly. Travel medicine is derived from infectious diseases and tropical medicine. With the establishment of the ISTM in 1991, the concept of TM was established and has grown exponentially in many countries across the globe.

Pre-travel care, with its focus on disease prevention and health promotion, is the cornerstone of travel health nursing care. Travel health promotion involves preparing travellers to prevent or manage illness and accidents whilst away from home. TM also involves ensuring a traveller understands the various health risks at their destination and knows how to avoid or minimise the risks. Vaccinations and special medications may also be provided to prevent disease. Travellers' medical kits,

containing prescription medications to treat common travel illness early and preventing serious disease are recommended, as well as ensuring the traveller has the appropriate travel insurance. Fitness to travel is also integral to this process (Travel Medicine & Vaccination Centre, 2014).

The rapid development of TM is an exciting and new interdisciplinary speciality in response to the health needs of the travelling population. In the United Kingdom the Department of Health has recognised the role of travel medicine specialists in helping to combat infectious disease and thereby confirms the need for specialist training in the field of travel medicine (Zuckerman, 2002).

2.3 OCCUPATIONAL AND LEISURE TRAVEL

There is a distinction to be made between the leisure traveller and the occupational/business traveller. Most employees normally travel only a short distance to and from work, whilst the occupational traveller can be defined as an employee that has a home base and travels away from his or her home base for short periods of time, for business purposes (Smith & Leggat, 2010). Then there is the employee who is expected to spend an extended (more than six months) away from his or her home base. This type of traveller is referred to as an expatriate. Both types of travellers (including migrant workers and workers returning from leave) have inherent travel issues that need to be considered.

A fit to travel assessment will include a full medical and recent surgery history to determine fitness to travel. Country profiling is important to determine international vaccine requirements for yellow fever and/or prophylaxis for malaria (WHO, 2005). The purpose and scope of International Health Regulations is “to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade” (International Health Regulations, 2005).

Travellers can be categorised as follows:

- Tourists - *recreational*

- Short-term business traveller - *occupational*
- Long-term business traveller - *occupational*
- Groups – sportsmen or sportswomen, politicians, pilgrims, volunteers, military and expat families - *occupational, recreational, habitational*
- Travel industry, tour guides, pilots and ship crew – *occupational*
- Refugees and internally displaced people – habitational (M. Ross 2014, personal communication, 3 March).

Van Aswegen (2009) concluded that the need for international business travel places high demands on employees. A challenging issue facing companies is the management of human resources. The employee needs to remain emotionally healthy, despite the challenges on a personal and professional level.

According to a World Bank and Hyatt Hotel survey, it was found that claims for psychological problems increased in frequent travellers. The study also concluded that frequent travellers were three times more likely to suffer from psychological disorders than non-travelling employees (Van Aswegen, 2009).

Smith and Leggat (2010) concluded that differences between occupational and leisure travel are that the occupational traveller has no choice of location or time of the year spent in a country. The location is not chosen for enjoyment or leisure and the adaptability is not taken into consideration. Adaptability includes the country, language, people and culture. The occupational traveller is usually very busy while away from the home base. As this person is usually travelling for the sole purpose of work there is no time for orientation to the host country, unless it is a long term assignment. Many expatriate positions, due to their inhospitable locations, are single status positions. In some instances, family members are allowed to accompany the traveller. In these circumstances, proper preparation is required for spouses and children, as well as for the employee. This result in a considerable cost to the company and more so if the family doesn't settle down in the host country and has to be repatriated (Smith & Leggat, 2010).

Smith and Leggat (2010) documented the impact of the occupational traveller on the employer. Illness and injury which are travel related may result in lost work-time and lost productivity. Due to the inherent disease and injury risks in developing countries the employer needs to secure some form of insurance that provides for the injured person to be transferred or air lifted to a suitable hospital, in the country or out of the country and also ensure that remains are repatriated to the home country in the event of death. For South African expatriates who contract malaria it becomes a reportable occupational disease as per the Compensation for Occupational Injuries and Diseases Act (COIDA). (Compensation for Occupational Injuries and Diseases Act. No.130 of 1993). Occupational health and safety standards in the host country may be of a lower standard than those in the home country. General health and hygiene facilities may also be of a lower standard in some countries. It is the function of the OHNP to help minimise costs by ensuring fitness to travel and assessing specific categories of workers sent as immuno compromised employees travelling to malaria and yellow fever endemic countries (Smith & Leggat, 2010).

Van Loggerenberg (2014) shared the cost of repatriation for workers who were evacuated by air, by International SOS, from African countries to South Africa. The cost was determined over a 12 month period from September 2013 to September 2014. During this time each evacuation cost US$25 000. Of the evacuated workers, 50% were related to trauma and 50% were related to medical conditions, of which cardiovascular incidence and malaria made up the bulk of the numbers. It is interesting to note that only 50% of the evacuees had undergone pre-deployment medicals (Van Loggerenberg, 2014).

Available data indicates that a high proportion of travellers experience health problems. Studies done on occupational travellers, although limited, indicate similar findings and although general traveller data indicate types of illnesses and degree of risk, the occupational traveller, by virtue of the work, is exposed to additional risks (Patel, 2011).

2.4 THE EXTENT OF TRAVEL HEALTH AND MEDICINE SERVICES

2.4.1 International review

The only international survey in TM was concluded in 1995. Hill and Behrens (1995) presented a paper in Mexico on a survey of travel clinics throughout the world. A questionnaire was sent to members of the ISTM (341 questionnaires were posted). Questions included demographic data of clinics, advice given, immunisations available and the educational training of the personnel. A total of 355 responses were received of which 14 were discarded due to there being duplicates from a single clinic.

The results indicated the following:

- *Location*: 57% of clinics were situated in the USA, 21% in Europe, 6% in the UK and Ireland, 6% in Canada and 11% in other countries in the world.
- *Type:* 41% of clinics were private, 20% were in schools of medicine, 10% were located in hospitals and 10% were situated in occupational medicine and student health practices.
- *Number of patients*: the median number of patients seen per year was 750.
- *Vaccinations and advice offered*: all clinics offered a variety of vaccinations and advice on malaria, diarrhoea and bite avoidance. Advice constituted 95% of their contact time with clients.
- *Who did what*: in the USA nurses provided advice 22% of the time as opposed to 8% of doctors. In most other countries nurses advised 57% as opposed to doctors 83%. Telephonic advice was offered in most clinics – 66% to the general public and 89% to other doctors.
- *Training*: 72% of nurses indicated that they had a general degree in nursing and 28% had further degrees and/or specialised training. This figure did not differ significantly among the various countries. 60% of doctors indicated that they had training in both infectious diseases and tropical medicine.
- *Fitness and post travel medicals*: 71% did pre-travel physical examinations and 75% saw ill travellers upon their return.

Despite similarities amongst the various services, most services were private clinics, followed by clinics affiliated to medical schools, hospitals, corporations and universities. The final outcome was that at the time the speciality was young and developing and that in time the ISTM would be providing recommendations and guidelines to develop optimal care to all travellers (Hill & Behrens, 1995).

2.4.2 Travel Medicine service providers in South Africa

According to the official SASTM (2015) website travel health service providers in the Republic of South Africa were located as follows:

Six towns in the Eastern Cape; four towns each in the Free State, North West and Limpopo provinces; 33 towns in Gauteng; 18 towns in KwaZulu Natal; 16 towns in the Western Cape; and five towns in Mpumalanga. Most of these services are offered within general medical practices and are private TM services (SASTM, 2015).

2.4.3 National Department of Health, South Africa

The National Department of Health in South Africa focuses mainly on its expanded programme on immunisation which includes children from birth to 12 years of age and pregnant women. It does not provide a travel vaccination programme in any of the provinces for employees or members of the public. Prior to the development of private travel services, the DOH provided yellow fever immunisation and travel health advice at district surgeons' clinics (Ross M 2015, personal communication, 1 February).

2.5 GLOBAL DISEASE TRENDS

Tatem, Rogers and Hay (2006) are of the opinion that the major contributing factor to the rapid spread of disease is the modern transport system, coupled with the growth of tourism and increased numbers of employees travelling for work purposes. This type of travel is mostly done by air.

Diseases like viral influenza strains such as the novel and severe acute respiratory syndrome viruses occur sporadically and there is no way of predicting when and where the outbreaks will be (Green et al, 1999). Haemorrhagic fevers like the recent

Ebola outbreak in West Africa and the continued increase of drug resistant Mycobacterium tuberculosis in South Africa continue to cause major concern (Hodges, 2014).

According to the World Health Organization (WHO) global warming and water shortages led to the re-emergence of dengue fever (WHO, 2014) in Southeast Asia, Africa, the Western Pacific, the Americas, the Eastern Mediterranean and Northern Australia. The Zika virus and its association with neurological defects presents a current challenge to travelers (WHO, 2016).

According to the Centre for Disease Control and Prevention (CDC) vector borne diseases, in particular malaria still remains an important health risk (CDC, 2014). In March 2014 a knowledge, attitude and practice study, conducted amongst general medicine practitioners and qualified travel medicine practitioners in the USA, confirmed that familiarity with malaria resistance patterns and antimalarial side effects scores were higher in certificate holders of travel medicine qualifications than general medicine practitioners and primary health care nurses (Kogelman, 2014). Imported malaria (where a mosquito from a malaria endemic country has been transported into a non-endemic country) from countries bordering South Africa, however remains a reality and is referred to as Odyssean malaria (National Institute for Communicable Diseases, 2013).

Patel (2014) presented a paper that illustrated the burden of malaria in overseas workers remained prevalent. Patel's research indicated that short term business travellers, although well informed, indicated poor compliance and 6% of this group developed malaria. Of expatriate travellers, also well informed with low compliance, on average 30% developed malaria within two years (Patel, 2014).

2.6 THE RELATIONSHIP BETWEEN TRAVEL AND HEALTH

In addition to biological hazards, occupational travellers, workers and expatriates working outside the borders of their countries can be exposed to physical and mental health hazards and risks due to travelling and working in foreign countries.

Patel (2011), in her review on psychological disorders and expatriate travellers, concluded that depression was the most common reason for psychiatric assessment followed by psychosomatic disorders, anxiety states and alcohol dependence. Frequent international travel was associated with increased medical insurance claims for psychological illness (Patel, 2011).

In their 2010 review entitled “Occupational Travel Medicine: Protecting the Health and Safety of Those Who Regularly Travel Overseas for Work” Smith and Leggat concluded that occupational travellers seemed to face a variety of health problems including jet lag, sleep disruption and other sleep related disorders more especially during travel across multiple time zones. Diarrhoea, food poisoning and other vector borne illnesses are also risks that have been identified. Venous thromboembolism (VTE) and accidents and injury in the work place (many being remote locations or countries with little or no medical infrastructure) were also found to be prevalent. Expatriate travellers may be faced with psychological issues due to separation from their families (Smith & Leggat, 2010).

To facilitate the study of the distribution and determinants of travel related diseases (health conditions), and to apply prevention and controls, travel epidemiology entails the who, what, where, when, how and why question to facilitate the collection, collation, analysis, interpretation and reporting of data to help:

- Plan required pre-travel services
- Identify who should receive advice and intervention
- Identify requirements for specific destinations
- Identify requirements for specific groups of travellers
- Prioritise pre-travel advice
- Assist informed post travel diagnosis and treatment
- Report to local health authority. The reporting system of notifiable diseases in South Africa is based on government law (National Health Act, Act 61 of 2003) which states that specific infectious diseases must be reported (Leggat, Ross & Goldsmid, 2002:5).

2.7 OCCUPATIONAL AND TRAVEL HEALTH NURSING

According to Guzik (2013) the traditional role of the OHNP is to keep workers healthy and productive, including promoting safety in the workplace. OHNPs work in diverse workplaces with a variety of workers in a multitude of work environments. This variety brings about physical, social, cultural, ergonomic, organisational, political and psychosocial issues (Guzik, 2013).

It is known that occupational travel has increased phenomenally in the 21st century and the workforce varies greatly in terms of age, gender, education, training, cultural background and health practices. Guzik (2013) reiterates the role of the OHNP as being preventative and promotive and that the role has expanded considerably, giving rise to OHNPs providing care in various settings (Guzik, 2013).

Rosselot in her 2004 research makes reference to the expanding role of the OHNP in travel health nursing. The same author emphasised that OHNPs have an important role to play to keep travelling employees (including frequent flyers, long stay expatriates, and special needs travellers) healthy, safe, and productive in the global marketplace. The OHNP must develop competencies in managing and customising health care to accommodate workers and the business environment (Rosselot, 2004).

Mutava (2011) also makes reference to economic globalisation, new technologies, demographic changes of the workforce - particularly aging, increased feminisation of the workforce and the increase of migrant workers - and the growing mobility of working people. The author also alludes to the changing role of the OHNP in order to cater for this evolving contemporary workplace (Mutava, 2011).

Travel Health Nursing (THN) is a specialty and has evolved since the 1980's in parallel with the field of travel medicine. Travel health nurses promote the health and safety of the leisure and occupational traveller.

THN has a unique body of knowledge and skill sets. It includes assessing and managing risks to prevent and manage injury and illness, applying preventative and

promotive interventions, like pre-travel assessments, immunisations, travel medication and health counselling. This role may include a curative aspect for the returning ill traveller. Like travel medicine, it is an interdisciplinary practice that employs the knowledge and skills of epidemiology, tropical medicine, vaccinology, public health and health education (ATHNA, 2015).

In South Africa nurses can complete a certificate of competence in TM through the University of the Witwatersrand in collaboration with the SASTM.

2.8 TRAVEL MEDICINE AND HEALTH IN OCCUPATIONAL HEALTH AND OCCUPATIONAL HEALTH NURSING

Globally health care is nurse driven and this is relevant to occupational health. Very limited literature was found on the role and function of occupational health nurse practitioners in travel medicine or health.

Although the Occupational Health and Safety Act (Act 85 of 1993), (OHS Act) and the Mines Health and Safety Act (Act 29 of 1996), (MHS Act) do not specifically refer to travel medicine per se the acts do however refer to the duty of the employer in ensuring the identification of unsafe conditions, acts or procedures that contribute to accidents, serious illness and health threatening occurrences and ensuring that preventative actions are put in place. It therefore falls within the responsibility of the employer to either provide travel health care or refer employees to an appropriate facility that can render these services (Occupational Health and Safety Act, No. 85 of 1993, 1993:37305. Mines Health and Safety Act, No. 29 of 1996, 1996:967)

A study was done in South Africa by Ross and Kocks in 1995 among OHNPs to determine if travel advice was given as a health promotion activity, the source of information used and the desire of OHNPs to access travel health information. The outcome of the study was that all the respondents confirmed that the OH service was responsible for health promotion. One-third of these respondents provided travel advice in their practices. One-third believed they should provide travel advice, and half of the respondents requested more information on travel medicine and ten

OHNPs specifically wanted more information on malaria prophylaxis (Ross & Kocks, 1995).

In 2001 Prince et al concluded in their research on Corporate Travel Medicine that on-site travel clinics realised a cost saving of 15% primarily due to the value of saving the time of employees and travel costs (Prince, Spengler & Collins, 2001).

In May 2013, at the ISTM annual conference (Netherlands), discussions were held with the WHO on reinforcing global health security and promoting the development of travel health. The WHO (2014) is of the opinion that the concept of collaboration, networking, evidence based guidelines and the training of travel health specialists in all countries needs to be expanded.

Zuckerman (2002) is of the opinion that the influx of foreigners from disease endemic countries places a burden on all health care systems. The public health implications of the growing numbers of refugees and immigrants from less developed countries need to be assessed and appropriate services need to be provided. The Consultancy for Africa Intelligence estimates that by 2013 the immigrant figures had increased to 5 million (Jacques & Mabiala, 2013).

The current labour market is filled with immigrants. They are often unskilled, and often substitute locals in the labour market. A great deal of work in industry is contracted out and these immigrants make up the labour force for these contractors (Statistics SA, 2012).

2.9 WORKPLACE HEALTH PROMOTION/WELLNESS

The integration of workplace health promotion (WHP) into occupational health is currently a global trend and is defined by the Ottawa Charter of 1986 as a process of enabling people to take control over and to improve their health. The process of health promotion includes advocating for health, enabling workers to achieve their full potential and mediating different interests in the workplace (society) in pursuit of health (WHO, 1986).

Huiskamp (2003) is of the opinion that workplace health promotion is an integral part of modern and contemporary management of health and safety. In a comprehensive workplace health management framework, health promotion or wellness is based on a risk assessment of the workplace, identifying hazards, identifying chronic diseases and the needs of the workers and being able to balance those needs within the business framework.

Travel medicine should be part of a comprehensive workplace health promotion/wellness programme. In managing travel health in the workplace the traditional occupational health concepts apply and may be expanded to include a country and health provider assessment if the business is based in a country other than the home country. Health promotion for occupational travellers may include endemic diseases like malaria prevention, alcohol use, food and water safety and work-life balance. Occupational travellers fall into the category of specific needs clients and as such health promotion should be very specific to their workplace and the environment in which they will be working. With the increase of women in the workplace, health promotion should be tailored to accommodate their additional needs.

2.10 SUMMARY

The literature reviewed identified the need to explore the concept of travel medicine and its role and challenges from the OHNPs perspective. The literature further highlighted the importance of identifying the risks for travellers as indicated by the increased volume of leisure and occupational travel. Being aware of global disease trends that are exacerbated by global warming and drought and that malaria remains an important health risk. The prevalence of psychosocial disorders was identified as well as the increased cost of evacuating employees. It was confirmed that travel health and medicine falls within the ambit of a workplace health promotion programme.

The chapter gave meaning to and interpretation of the concept of travel medicine, the nature and importance of the role of the OHNP and the research conducted on travel medicine.

CHAPTER THREE

RESEARCH DESIGN AND METHOD

3.0 INTRODUCTION

In this chapter an outline of the research approach adopted for this study is explained, including the data collection method used, techniques applied in the sampling method and questionnaire design. The constructs emanating from the conceptualisation phase (discussed in Chapter One) were measured in the operational phase by means of a survey method utilising a self-administered questionnaire.

According to Blankenship (2011), research involves a systematic process. This involves objectivity and the collection of information for analysis to conclude a research project. The process is followed in all research methods.

The following steps are part of the process that was followed in this research.

3.1 RESEARCH DESIGN

A research design reflects the purpose of a study and is characterised by exploration, description, explanation, prediction, evaluation and history.

Van Wyk (2012) stipulates that “research design articulates what data are required, what methods are going to be used to collect and analyse the data, and how all of this is going to answer your research question. Both data and methods, and the way in which these will be configured in the research project, need to be the most effective in producing the answers to the research question.”

The research design used for this study can be described as quantitative and cross-sectional.

3.1.1 Quantitative research

Quantitative research is empirical, using numeric and quantifiable data. Factual (quantitative) information was desired to identify knowledge, attitudes and practices of travel medicine of OHNPs, to facilitate deductive reasoning (Creswell, 2014).

3.1.2 Cross-sectional study

According to Saint-Germain (2015) a cross-sectional study is the analysis of data collected from a population, or a representative subset, at one specific point in time. In this study data were collected at the same period of time, namely during the month of July 2015. No follow up data were collected. Data were gathered to identify knowledge, attitudes and practices of travel medicine by OHNPs in their practices.

3.2 RESEARCH METHOD

The survey method was used in this study. Survey research entails the selection of a sample of participants within a population and then administering a standardised questionnaire to them. The questionnaire can be a written document that is completed by the person being surveyed. The data collection can be face to face, telephonic interviews, self-administered or submitted electronically, or by other means (Colorado Education Guides, 2015). In this study the survey research method entailed electronically mailed, self-administered questionnaires.

3.2.1 Motivation for the use of the survey method

According to the Colorado Education Guides (2015), when using the survey method multiple questions can be asked about a subject, giving extensive flexibility in data analysis. Advanced statistical techniques allow for data analysis to determine validity, reliability, and statistical significance, including the ability to analyse multiple variables. Collected data covers a broad range of opinions, attitudes and practices. The data are factual. One reaches a larger population and this reduces bias as there is no personal contact (Colorado Education Guides, 2015). Therefore this method was chosen as it was considered to be the most effective method of collecting answers to the questions in the survey.

3.2.2 Disadvantages of surveys

According to the Colorado Education Guides (2015) the reliability of survey data depends on many factors and ranks low in the hierarchy of research methodologies. Respondents may embellish or give unfavourable answers. Closed-ended questions may have a lower validity rate than other question types. Surveys typically have a low response rate (Colorado Education Guides, 2015).

3.3 CONTEXT AND SETTING OF STUDY

Context refers to the background surrounding the information. Without context, information can be misinterpreted; with context, information can be understood (Talja, Keso & Pietiläinen, 1999).

The study was conducted in the Central Gauteng SASOHN district. This district was chosen by the researcher as it had a diversity of occupational health settings, an identifiable population of professional OHNPs, and for economic considerations such as being the main centre of industry and having the highest concentration of OHNPs working in multiple industries for which employees tend to work.

The location for this study was diverse workplace settings in the Central Gauteng SASOHN district. The setting comprised Johannesburg, which accounts for 92% of the province, including the Vaal Triangle and the West Rand according to the SASOHN (SASOHN, personal communication 2014, February 03).

3.4 POPULATION

Polit and Beck define a population as the entire group of persons which interests the researcher. The target population is the group of persons about which the researcher would like to make generalisations and the accessible population is that group of people that conforms to the designated criteria and that are accessible as a pool of participants or a study (Polit & Beck, 2004).

For the purpose of the study, it was not feasible to use all the OHNPs in South Africa and therefore an accessible population of all OHNPs in Central Gauteng on the SASOHN database was used. There were 896 OHNPs in this area that are members of the SASOHN (SASOHN 2014, personal communication, 3 February). Table 3.1 indicates the refinement process.

Table 3.1 Breakdown of the population

Total number of nurses registered on Gauteng data base	896
Total number of non-active e-mail addresses	404
Refined to Central Gauteng / Vaal Triangle / West Rand	492
Returned questionnaires	170
Included in analysis	154

3.4.1. Inclusion criteria

The criteria that specify population characteristics are referred to as eligibility or inclusion criteria (Polit & Beck, 2004). The criteria that had to be met for inclusion in the study were:

Participants were restricted to professional nurses working in the field of occupational health. The nurses had to be members of the Central Gauteng SASOHN branch, including the Vaal Triangle and the West Rand. Participants who did not fulfil the inclusion criteria were excluded.

3.5 THE SAMPLE AND SAMPLE SIZE

A description of the population, sampling method and sampling procedures of this study is provided in this section.

Polit and Beck (2004) describe a sample as a subset of the population elements. The sample for this study was derived from the accessible population as described above. A major consideration of a sample in quantitative studies is its representativeness. A representative sample is one of which the key characteristics closely approximate those of the population from which the sample comes (Polit & Beck, 2004).

3.5.1 Sample size

The SASOHN data base provided details of 896 OHNPs for the Central Gauteng area. This figure was not considered to be a true reflection; hence the data base was refined. The accessible population size was 492. The refining process consisted of deleting e-mail addresses that bounced back as no longer being valid. Using Raosoft Sample Size Calculator the sample size was calculated in order to estimate the perceptions of the respondents with 5% accuracy and a 90% - 95% confidence interval. The required sample size of 175 was calculated from the total population size of 492 OHNPs. The size was appropriate considering the researcher's resources and time limitations of the study (Raosoft, 2004).

The refined Central Gauteng, Vaal Triangle and West Rand SASOHN data base had 492 members (n = 492). In order to obtain a 90% level of confidence of the 492 members, at least 175 questionnaires needed to be completed.

3.5.2 Sampling method

The study used a census or total population sampling method. This method was used as it would include the total population of nurses with specific characteristics (Laerd Dissertation, 2012). For this study it would include all practising OHNPs on the Central Gauteng SASOHN data base (including the Vaal Triangle and the West Rand) as opposed to all the nurses on the data base.

3.5.3 Sampling procedure

The sampling procedure for this study involved the following:

- Identifying the accessible population.
- Confirming the eligibility criteria.
- Obtaining consent from the SASOHN to use the member data base.

The accessible population was identified as follows:

- The SASOHN was contacted and a list of names and electronic contact details was obtained.
- From the list of names member information pertaining to Central Gauteng, West Rand and Vaal Triangle was extracted and a mailing list created.
- To request the cooperation of the participants, the researcher attended meetings at Central Gauteng (including the Vaal Triangle and West Rand) to inform OHNPs about the study. This was announced in the education section of the meeting and captured in the minutes. OHNPs were informed about the research and encouraged to participate.

3.5.4 Problems encountered in the sampling process

Problems encountered in the sampling process were e-mail addresses on the list from the SASOHN that were incorrect and no longer valid.

3.6 ETHICAL CONSIDERATIONS

Ethics is the branch of philosophy that deals with the dynamics of right and wrong decision making. Research ethics involve the protection of dignity of subjects and the publication of the information in the research (Fouka & Mantzorou, 2011).

The following ethical considerations were taken into account:

Approval to conduct the study: Approval to conduct the study was obtained from the Human Research Ethics Committee (Medical) (HREC) of the University of the Witwatersrand. Protocol number: M150233 (Appendix A).

Access to the SASOHN database: A request was forwarded to the SASOHN National Office for permission to access and use the list of names and addresses of its members in the Gauteng Central District (Appendix B). Permission was granted by the Chairperson to announce the study with a request to members to participate in the study (Appendix C).

Informed consent: This means that a person knowingly, voluntarily and intelligently and in a clear and manifest way gives their consent (Fouka & Mantzorou, 2011). The e-mail questionnaire was accompanied by a participant's information sheet that outlined the purpose of the research and requesting participation (Appendix D). Participants were under no obligation to complete the questionnaire. They had the right and freedom to refrain from answering questions, submitting the questionnaire and could withdraw from the study at any time without suffering any negative consequences. Completion and return of the questionnaire was taken as expressed, informed consent to participate in the research. To ensure the confidentiality and anonymity of the participants no names were recorded on the questionnaire.

Anonymity and confidentiality: Anonymity and confidentiality were maintained by not including a written consent form. To ensure that the participants' identities could not be linked to personal responses, no organisational names or any personal identifiers were required on the questionnaire. Code numbers were used during data collection and data were reported in aggregate form with identity not traceable to specific nurses in any manner. The submission of the questionnaires was sent directly to a password protected e-mail address that was only accessible to the researcher. Raw data was only accessible to the researcher and the statistician and all completed questionnaires were saved electronically on REDcap. The data will be kept for five years in a secure place.

Right to privacy: The researcher respected the participants' privacy by not sharing the information gathered from them without their knowledge or consent. Data will be presented collectively so as to avoid identification of any individuals. According to Blankenship (2011), research involves a systematic process. This involves objectivity and the collection of information for analysis to conclude a research project. The process is followed in all research methods.

The following steps are part of the process that was followed in this research.

3.7 DATA COLLECTION

3.7.1 Data collection instrument

As no appropriate questionnaire could be found, the researcher developed a closed and open ended self-administered questionnaire/survey tool based on current travel health and medicine information. The questionnaire contained sections on demographic aspects of the nurses, workplace and travel information including knowledge, attitude and practice based questions concerning TM. The questionnaire was compiled using REDcap software, version 6.9.5. The questionnaire was sent to participants electronically (Appendix E).

3.7.2 Self-administered questionnaire as a data collection method

A questionnaire is a survey method that uses a standardised set of questions given to individuals or groups and when it is self-administered a respondent completes it on his or her own, either on paper or via a computer (Burns et al, 2008).

Questionnaires allow for large numbers of individuals from widespread geographical locations to be sampled cost effectively (Polit & Beck, 2004). Questionnaires also have standardised questions which not only make measurement more precise by enforcing uniform definitions upon the participants, but also ensures that similar data can be collected from groups and then interpreted comparatively (Colorado Education Guides, 2015).

A limitation of self-administered questionnaires is the possible poor response rates which can restrict researchers in their quest to generalise findings to the population. The other limitation is the possibility that the respondent either does not complete or only partially completes the questionnaire (Coughlan, Cronin & Ryan, 2009).

3.7.3 Structure of the self-administered questionnaire (Appendix E)

The instrument was designed to gather data on the Knowledge, Attitudes and Practices of OHNPS related to Travel Health and Medicine and consisted of five sections:

- **Section 1: Personal and workplace information**
  This section included questions on place of work, qualification in occupational health, gender, age and number of years working in OH. The researcher also

questioned the type of travel practices of the respective businesses and employees.

- **Section 2: Education and training in travel medicine**
  This section investigated qualifications in TM, registration with the SASTM and validity of dispensing licence.

- **Section 3: Knowledge based questions**
  This section investigated the knowledge of nurses in respect of their understanding of TM and the role of vaccinations.

- **Section 4: Attitude based questions**
  With the use of a 4 point Likert scale, this section questioned nurses as to how they felt about TM being included in OH practice, the importance of training in TM and if TM should be included in OHN education.

- **Section 5: Practice based questions**
  This section questioned nurses as to their practice of TM and their use of vaccinations.

REDcap software version 6.9.5 was used to create the questionnaire. This package was used as it enables a spread sheet of data to be created that can be transferred into Microsoft Excel 2010. This raw data was analysed with the input from a statistician.

A senior biomedical statistician from the Medical Research Council (MRC) assisted the researcher to analyse the data using the statistical package 'STATA' version 13.

3.7.4 Validity and reliability of the instrument

According to Brink, Van der Walt and Van Rensburg (2012) the validity of an instrument refers to the degree with which outcomes can be manipulated and generalised. The questionnaire was designed by the researcher as no other suitable questionnaire could be found. Five expert health professionals in the field of travel

health and medicine were asked to determine the content validity of the questionnaire by means of Lynn's content validation index. The 4 point Likert scale descriptors are depicted in Table 3.2 (Bruce and Lack, 2009).

Table 3.2 Likert scale descriptors that were used

SCORE	DESCRIPTOR
1	Not relevant
2	Unable to assess relevance without item revision; in need of revision ; no longer relevant
3	Relevant, but needs minor alteration
4	Very relevant

The questionnaire comprised of 33 questions. The expert group found that 14 questions were very relevant, 13 were relevant with minor alterations, two required rephrasing and four questions were not relevant at all. The questionnaire was corrected accordingly to accommodate alterations and rephrasing. The four questions found to be irrelevant were discussed with the research supervisor and were subsequently slightly altered and included.

The reliability of the instrument is ensured by pre-testing it for layout, clarity, specificity and completeness. The pre-testing of the instrument was done by four occupational health nurse practitioners who were not part of the study. Internal consistency was measured by the use of the Cronbach's alpha to ensure scale reliability. On completion of the data analysis, the internal consistency of the questionnaire was demonstrated by the Cronbach's alpha co-efficient of 0.82 for the 71 non-demographic items of the instrument. When the demographic data was added the score was 0.84.

In section 4 - the attitude based questions of the questionnaire - data were analysed to determine the level of agreement with statements about TM. A 4 point Likert scale was used for this question consisting of 1 and 2 used for strongly disagree and disagree and 3 and 4 used for agree and strongly agree.

The responses to the questionnaire, internal consistency of the measuring instrument and the constraints faced during data collection are also described. Findings are presented in tabular, graphic and written form.

3.7.5 Pre-testing of the questionnaire

The questionnaire was pre-tested prior to the commencement of the study. The questionnaire was tested on four (4) OHNPs that were not part of the study and have qualifications in OHN (4) and TM (1). The questionnaire was tested to determine ability to comprehend and answer the questions. This also determined the length of time needed to complete the questionnaire and the effectiveness of the instructions. The outcome was favourable with no changes suggested.

3.8 DATA COLLECTION PROCEDURE

The researcher requested permission from the chairperson of the Central Gauteng SASOHN branch for the study to be announced at the monthly meeting prior to the data collection commencement and to include an item on the meeting minutes to inform the OHNPs about the study. The researcher then sent out the questionnaire and information package by means of REDcap to all eligible OHNPs on the Central Gauteng database. An e-mail address account was created specifically for the purpose of the study and administered by an independent fieldworker who is not involved in the study. Reminder e-mails were sent out at two and three week intervals after initial posting and dispatch of the questionnaire.

3.9 DATA ANALYSIS

According to Brink, Van der Walt and Van Rensburg (2012), data analysis entails categorising, ordering, manipulating and summarising the data and describing it in meaningful terms.

Data analysis using descriptive statistics were used. Statistical analyses included relevant descriptive statistics (frequencies and percentages). Statistical assistance was obtained from a biostatistician from the Medical Research Council in Pretoria.

Data were analysed by using the Stata Version 13 software (Data Analysis and Statistical Software).

3.10 SUMMARY

The objective of this chapter was to give an overview of the research design and method used to answer the research questions. A description is given of the target and accessible population and the sampling process used. The planning of the empirical research, the pilot study, design of the data collection instrument and the data collection procedure, as well as the methods to ensure reliability and validity of the instrument are discussed. The chapter also presents and discusses the ethical procedures followed to ensure protection of the human rights of the research participants.

CHAPTER FOUR

RESULTS AND DISCUSSION OF FINDINGS

4.0 INTRODUCTION

This chapter presents the results of data collected from OHNPs in diverse occupational health settings in the Central Gauteng district. In addition, the findings of the study are discussed.

4.1 RESULTS AND FINDINGS

4.1.1 Response rate

Table 4.1 presents a summary of the respondents to the distributed questionnaire. Based on the refined e-mail data list from the SASOHN, 492 questionnaires were distributed. Of the 492 questionnaires sent out, 170 were returned and 16 were discarded as they had not been completed by the respondents at all. A response rate of 34% was achieved in this study.

Table 4.1 Respondents to the distributed questionnaire

Final refined list and distributed questionnaires	492
Returned questionnaires	170
Questionnaires used in analysis	154
Percentage of true respondents	**34%**

4.2 QUESTIONNAIRE SECTION 1: PERSONAL AND WORKPLACE INFORMATION

In section 1 of the questionnaire, respondents were requested to provide information on their place of work, qualification in occupational health, gender, age and years working in OHN. Information was also requested on the type of travel practices of the businesses and employees.

- **Type of workplace**

The reported workplaces of the OHNPs are depicted in Figure 4.1

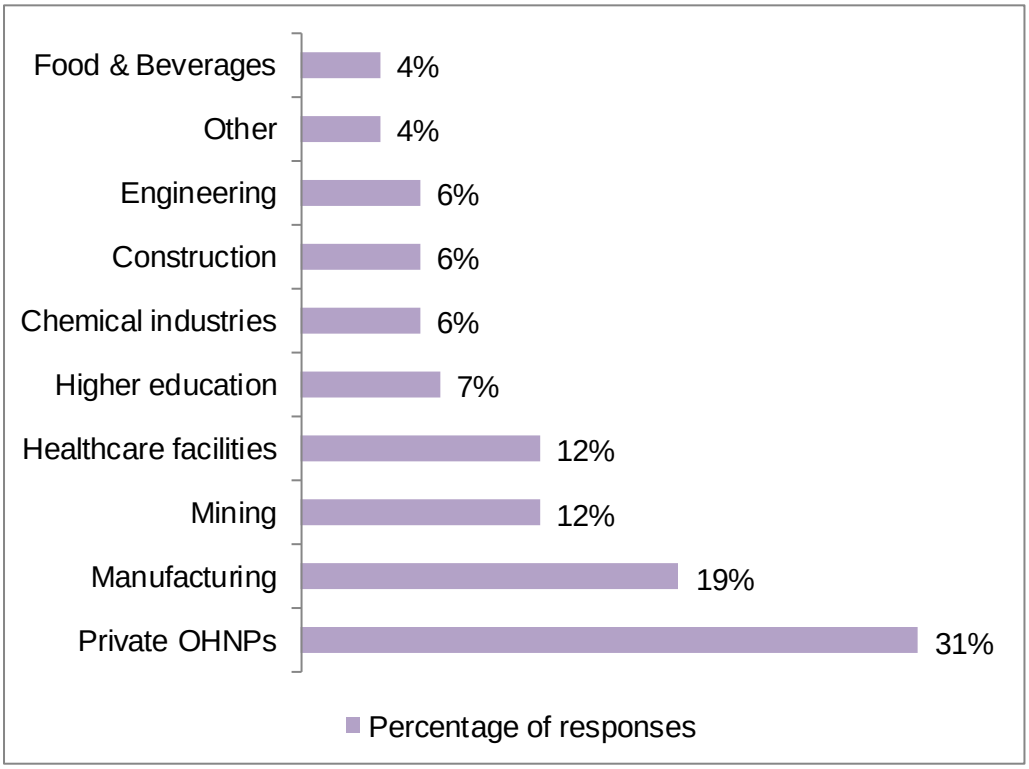

Figure 4.1 Workplaces of OHNPs (n=154)

The response from 154 (n=154) respondents indicated that 48 (31%) of OHNPs practised as private practitioners. The Police Service and Military were provided as an option; however, no respondents chose this option. Respondents (4%) indicated other workplaces that included travel clinics, the retail sector, cruise ships and airlines.

- **Occupational Health Nursing qualification**

Respondents were requested to state their occupational health nursing qualifications and these are depicted in Table 4.2.

Table 4.2 OHN qualification of respondents (n=152)

OHN Qualification	Frequency	Percentage
Certificate	31	20%
Diploma	**102**	**67%**
Masters Course work	5	3%
Masters Dissertation	4	3%
No OHN Qualification listed	10	7%
Total	152	100

It is evident from Table 4.2 that the majority of respondents hold a diploma in OHN followed by those who have a certificate in OHN. Only a small percentage of participants reported attainment of a master's degree. Ten respondents, although members of the SASOHN, indicated that they have no OHN qualification.

- **Gender**

Of the 154 respondents who answered the question on gender, 92 % (n = 141) were female and 8% (n = 13) were male.

- **Age distribution**

Figure 4.2 provides an overview of the age distribution of the respondents and indicates that the highest percentages were in the age group 46 to 55 years. Forty-three (28%) respondents were in the age group 36 to 45 years and 21% in the age range of 56 years and older. Only fifteen (10%) respondents were in the age group 20 to 35 years. It is evident from figure 4.2 that 90% of the respondents were in the age group of 36 to 66 years and older.

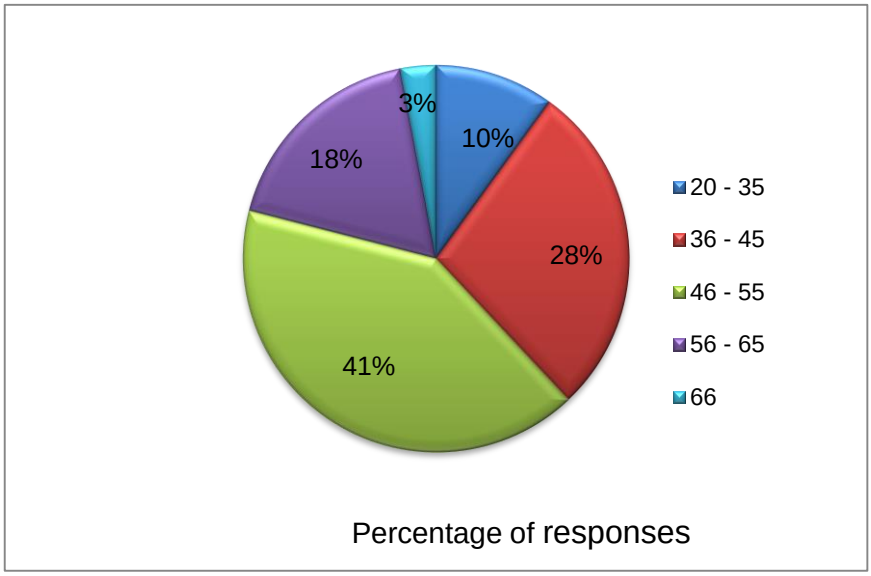

Figure 4.2 Age groups of participants (n=152)

- **Years of Occupational Health Nursing Experience**

Respondents were requested to indicate the length in years that they have been working in OHN as is illustrated in Table 4.3.

Table 4.3 Years OHNPs have worked in Occupational Health Nursing

Years in OHN (n = 151)	Frequency	Percentage
< 1 year	5	3%
1-4 years	27	19%
5-9 years	34	22%
10-15 years	37	24%
> 15 years	**48**	**32%**
Total	151	100%

Of the 151 respondents, the largest number of OHNPs has been working in the field of OHN for longer than 15 years. This is followed by 37 (24%) who have been working in OHN for 10-15 years. Twenty-seven OHNPs reported 1-4 years of experience whereas 5 (3%) had less than one year OHN experience.

- **Travel range of employees for work purposes**

Figure 4.3 illustrates the spatial and time range of travel for business and demonstrates that those who report employees travelling for work outside the borders of RSA in the short term (n=71, 46%) is twice as many as for longer than six months (n=37, 24%). There was a significant difference found in the destinations and length of travel of different employees. Fifty-five (36%) respondents indicated that employees travelled for work within the borders of RSA. Responses revealed that some of their employees travelled within as well as outside the borders of RSA for business purposes. Twenty-nine percent of respondents indicated that no employees travel for work in their company.

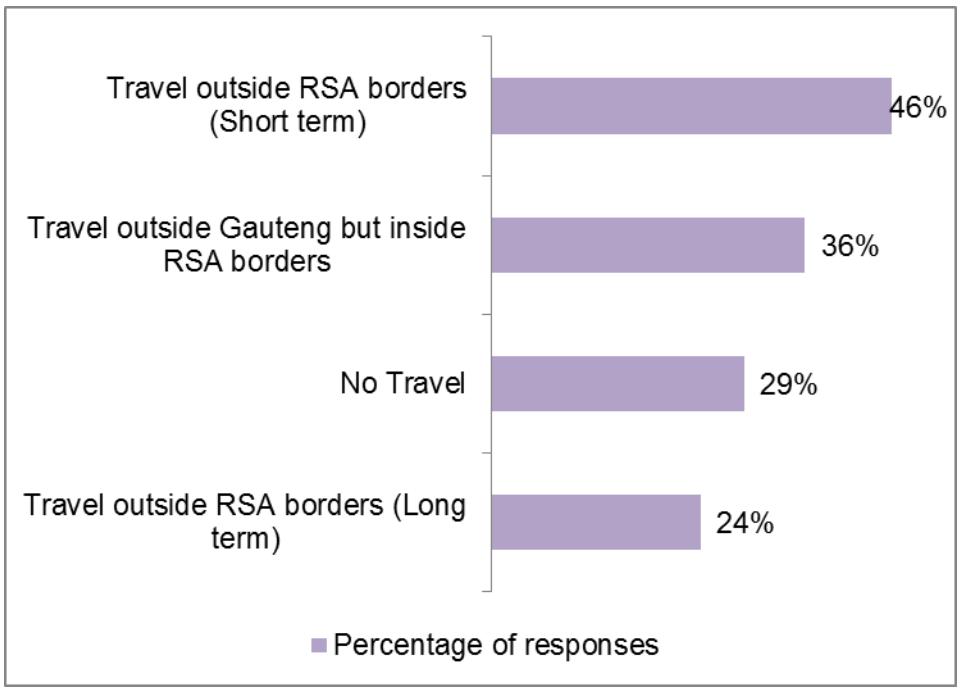

Figure 4.3 Travel range of employees (n=153)

- **Travel for work outside RSA borders**

Figure 4.4 depicts the extent of travel outside the borders of RSA. Travel to African countries was reported by 85% of respondents and exceeds travel to other continents.

Fifty-two (51%) respondents indicated business travel to Europe. These data confirm that travel is prevalent and mostly on the African continent. Only 19 (18%) indicated that their employees travelled to Australia for business purposes.

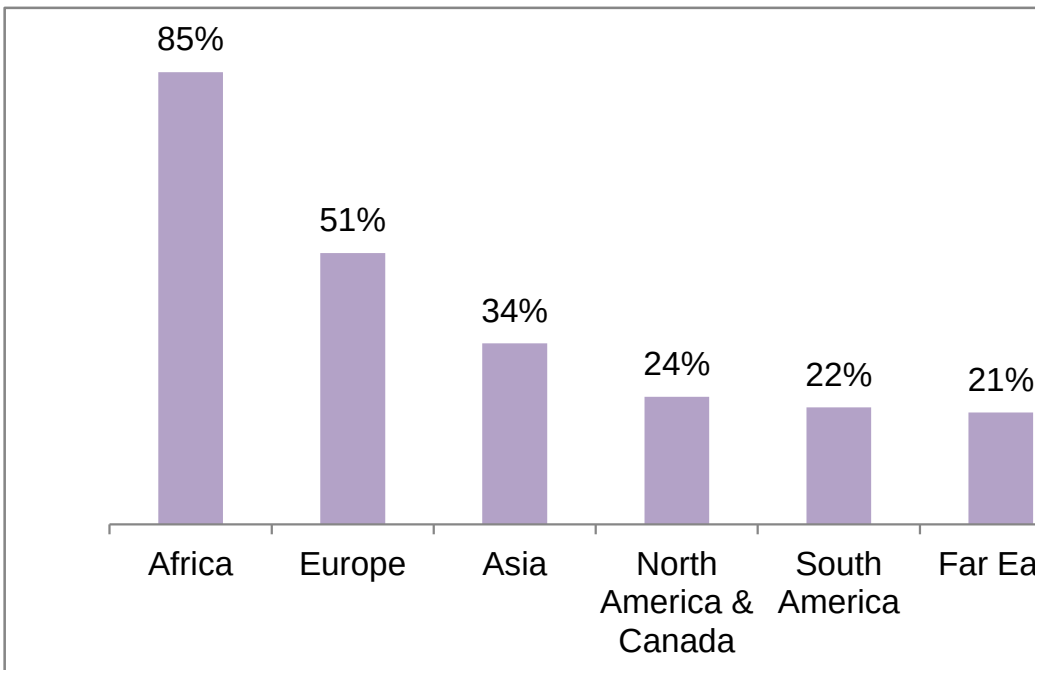

Figure 4.4 Travel outside the borders of RSA (n=101)

- **African countries that employees travel to and country of origin of foreign employees**

Respondents were asked to indicate to which African countries employees travelled for work. In addition, respondents were also asked if any of their employees originated from African countries and, if so, to indicate which countries in Africa.

Figure 4.5 (a) indicates the countries from which employees originate. Of 146 respondents, 86 (59%) reported that their business/company employed people from other African countries. A further 49 (34%) stated that they did not employ foreigners and 11 (7%) did not know.

Many South African businesses employ workers from African countries and Zimbabwe (41%) was the most frequently cited. The others included Zambia 7%, Lesotho 7%, DRC 6%, Swaziland 4%, Botswana 4% and Malawi 2%.

Figure 4.5 (b) indicates African countries in which RSA companies do business. The results indicate high levels of business activity in Mozambique (n=25, 13%), Botswana (n=24, 13%) and the DRC (n=23, 12%). The remaining data indicate

widespread movement around the African continent including Namibia 9%, Angola 8%, and Nigeria 7%, Ghana and Tanzania at 6% and Kenya at 5%.

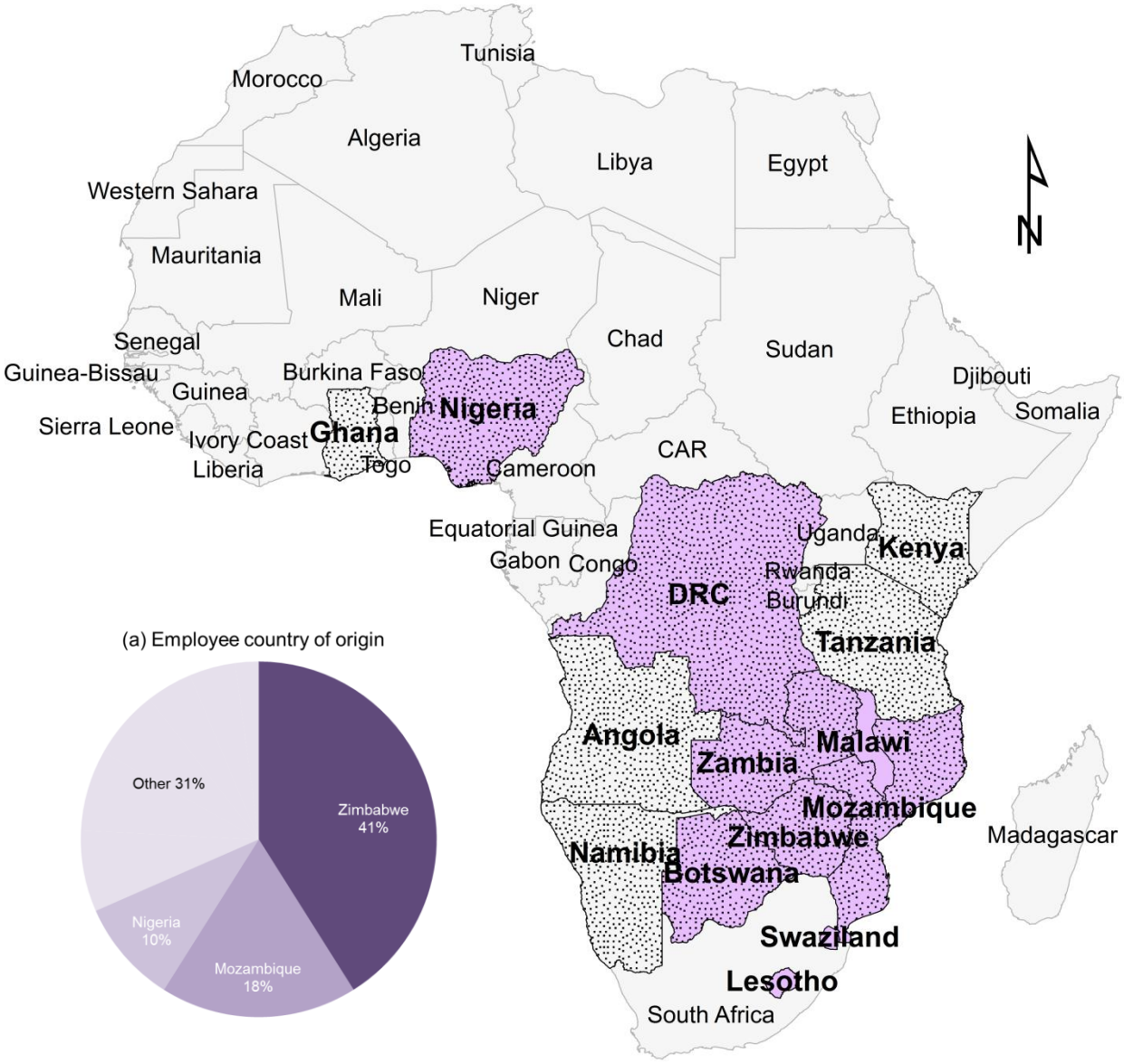

Figure 4.5 Map of Africa illustrating countries of origin of employees and countries in which RSA companies conduct business. Inset pie charts indicate associated percentages.

Employees' countries of origin other than Africa

Respondents were requested to indicate if employees came from countries other than Africa. Table 4.4 indicates non-African countries from which employees come.

Table 4.4 Countries other than Africa from where employees originate

Countries other than Africa from where employees originate	Frequency	Percentage
North America and Canada	15	19%
UK	9	11%
Europe	8	10%
Asia	7	9%
Australia	7	9%
India	6	8%
South America	4	5%

4.3 QUESTIONNAIRE SECTION 2: EDUCATION AND TRAINING IN TRAVEL MEDICINE

In this section of the questionnaire the researcher wanted to ascertain the extent of formal education in Travel Medicine and relevant membership registration.

- **Certificate of Competence in Travel Medicine – OHNPs**

Of 130 respondents 14 (11%) have a Certificate of Competence in Travel Medicine and 114 (89%) do not have any Travel Medicine training, with the two members additional to those 14 who are certified awaiting results of the 2015 course.

- **Certificate of Competence in Travel Medicine – OMPs**

Of 122 OHNP respondents 49 (40%) stated that their OMP has a Certificate of Competence in travel medicine and 73 (60%) do not have any training.

- **Membership of SASTM – OHNPs**

Of 127 nurses responding to this question, 16 (13%) are members of the SASTM (i.e. those who have completed the certificate course) and 111 (87%) are not members of the SASTM.

- **Registration with Department of Health (DOH) to dispense medicines and Yellow Fever Vaccinations**

For OHNPs to dispense medicines, a valid dispensing licence is required. A requirement from the DOH for a yellow fever licence is proof of a valid dispensing licence. Table 4.5 illustrates as follows:

Table 4.5 Registration with DOH to dispense medicines and yellow fever vaccinations

Dispensing Licence (n =127)	Frequency	Percentage
Yes	107	**84%**
No	20	16%
Yellow fever (n = 126)		
Yes	14	11%
No	112	89%

Of the 127 respondents, 107 (84%) reported having a valid dispensing licence and 20 (16%) did not. Fourteen respondents (11%) confirmed they were registered to give yellow fever vaccines and 112 (9%) were not.

4.4 QUESTIONNAIRE SECTION 3: KNOWLEDGE OF TRAVEL MEDICINE

In the knowledge section of the questionnaire, respondents were asked questions to determine their knowledge of travel medicine.

- **Statements that describe travel medicine**

All of the statements describe aspects of travel medicine. OHNPs (n=102, 87%) indicated that vaccination was the most important component of TM. This was

followed by (n=92, 78%) disease prevention. Figure 4.6 gives a further breakdown of respondents' answers.

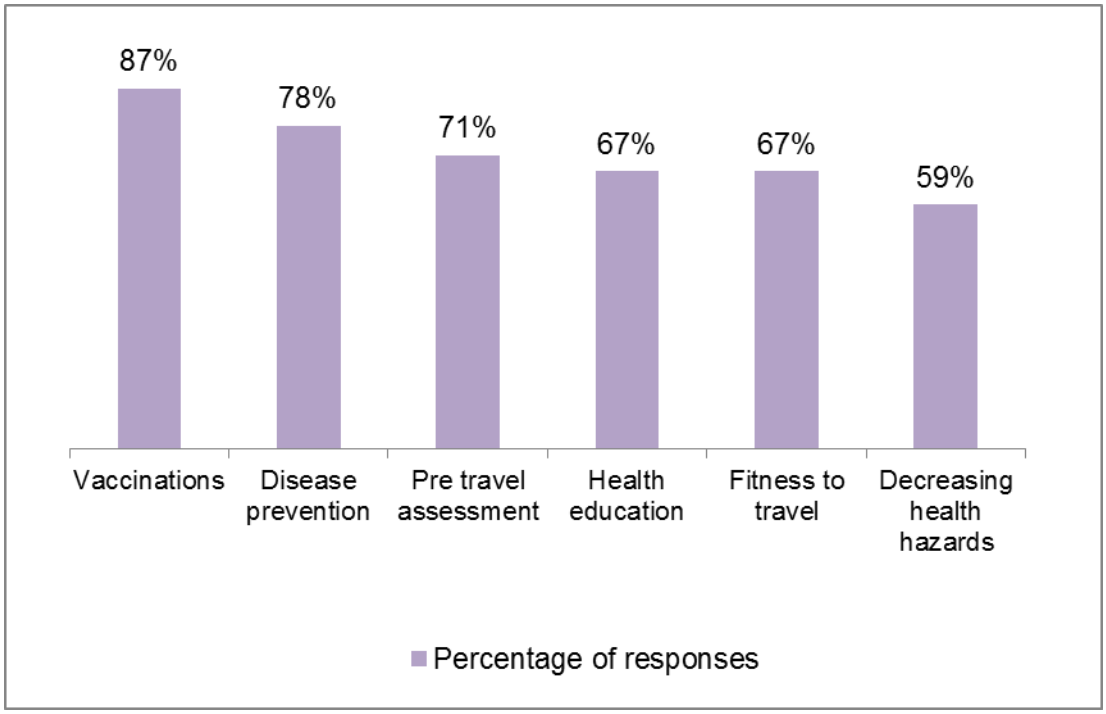

Figure 4.6 Statements that describe TM (n=117)

- **Advice for employees travelling to malaria areas**

Respondents were given a list of important interventions used in malaria prevention and treatment. All of these suggestions are in fact equally important. Table 4.6 gives a breakdown of the responses.

Table 4.6 Advice for employees travelling to Malaria areas (n=111)

	Frequency	Percentage
Chemoprophylaxis	79	71%
Bite prevention	84	75%
Investigate any fever	81	73%
Report recent travel to malaria area if not feeling well	97	**87%**

Table 4.6 provides a breakdown of the advice given to employees travelling to malaria areas.

- **Yellow fever vaccination and booster administration**

Respondents were asked at what interval a yellow fever booster vaccination should be given. Table 4.7 indicates the results.

Table 4.7 Yellow fever and booster administration (n=104)

	Frequency	Percentage
Every 5 years	12	11%
Every 10 years	44	42%
Every 15 years	2	2%
Never	9	9%
Do not know	39	37%

Only nine (9%) correctly stated that one yellow fever vaccine per lifetime provides immunity for life. This is correct as per the National Department of Health (NDoH) Yellow Fever brief issued in February 2015 (NDoH, 2015:02).

- **Meningococcal vaccine**

Respondents were asked when it was appropriate to give a meningococcal vaccine. Table 4.8 provides a breakdown.

Table 4.8 Meningococcal vaccine administration (n=105)

	Frequency	Percentage
If you are a first year student living in residence	36	34%
If you are a military recruit	44	41%
If you have a damaged or removed spleen	19	18%
If you are travelling to or reside in a country where the disease is common	97	92%

All of the statements are in fact correct. The awareness that meningococcal vaccination needs to be given for travel is assumed although in other occupational settings is inadequate.

- **Vaccine preventable disease**

Respondents were given a list of diseases and asked if the diseases mentioned were vaccine preventable. Table 4.9 indicates the responses from the 112 who replied.

Table 4.9 Vaccine preventable disease (n=112)

	Frequency	Percentage
Hepatitis A	87	77%
Hepatitis B	100	89%
Yellow fever	103	92%
Meningitis	80	71%
Tetanus	101	90%
Dengue	17	15%
Rabies	72	64%
Malaria	53	47%

Besides malaria and dengue, all the diseases are vaccine preventable. A malaria vaccine trial commenced in Africa for new-born up to 3 month old babies, but is not currently available for adults and hence occupational travellers. No vaccine is available for dengue fever.

4.5 QUESTIONNAIRE SECTION 4: ATTITUDE TOWARD TRAVEL MEDICINE

In this section of the questionnaire respondents were asked how they felt about travel medicine services within Occupational Health Nursing Practice and if travel medicine should be included in the role of the OHNP. The responses are shown in Table 4.10 and Figure 4.7.

Table 4.10 Attitude toward travel medicine (frequency)

Question	Strongly Disagree	Disagree	Agree	Strongly agree
Travel Medicine should be part of OHN practice (n = 110)	1	9	57	43
OHN education should include a module on Travel Medicine (n = 110)	1	2	53	54
OHNPs can add value to their practice by offering TM (n = 111)	2	2	50	57
OHNPs have time to offer TM (n = 111)	4	35	55	17
TM is a future role for OHNP's (n = 110)	4	7	67	32
I want to learn more about TM (n = 108)	2	6	41	59
Employees can be advised comprehensively by offering TM services (n = 108)	1	3	58	46
TM is part of a workplace wellness/health promotion programme (n = 110)	2	9	51	48

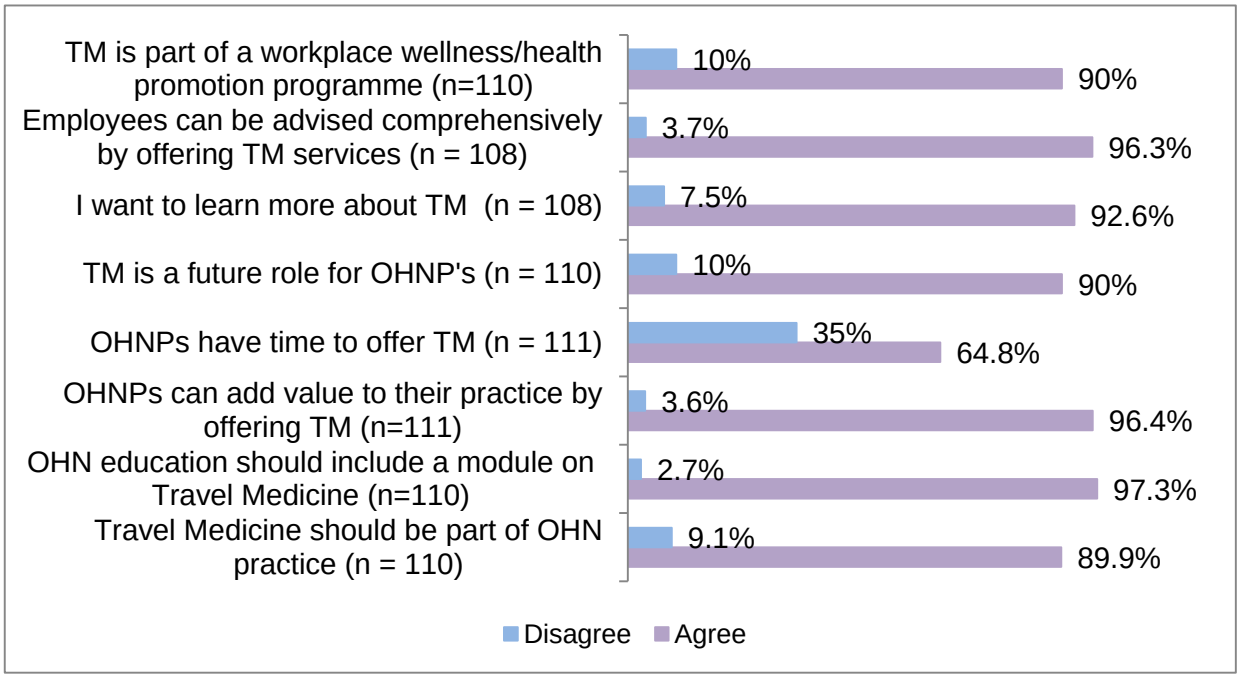

Figure 4.7 Attitude toward travel medicine (percentage responses)

There is prevailing agreement by 110 (90%) that there is a place in occupational health practice for travel medicine with 89% of nurses strongly agreeing that travel medicine should be part of OH practice and 108 (92%) feeling strongly the need to learn more about travel medicine. There was vast support by 110 (97%) for the inclusion of travel medicine in OHN education. Less than 4% strongly disagreed with any of the statements.

4.6 QUESTIONNAIRE SECTION 5: PRACTICE BASED OPINIONS

- **Do you provide travel medicine services in your clinic?**

In this section of the questionnaire, the researcher wanted to probe the practices of OHNPs who were providing travel medicine in their clinics and attempting to determine how many employees are referred to external travel medicine clinics. Of 107 respondents, 35 (33%) reported TM in-house and 72 (67%) did not provide in-house services.

- **Types of travel medicine services offered in-house**

This question explored what types of in-house travel medicine services were offered and the responses are shown in Table 4.11.

Table 4.11 Types of travel medicine services offered in-house (n=35)

	Frequency	Percentage
Pre-travel assessment	18	51%
Travel health promotion/education	17	49%
Leisure travel guidance	0	0%

Only 35 OHNPs responded to this question with 18 (51%) indicating that they perform pre-travel assessments, whilst 17 (49%) provided health promotion and education related to travel medicine.

- **Do you refer to external travel medicine providers?**

Respondents were asked to indicate if employees were referred to external travel medicine service providers. Of the 88 OHNPs responding 64 (73%) reported referring to external service providers and 24 (27%) did not refer to external providers.

- **Which of the following vaccines do you provide?**

To determine what types of vaccinations were being offered in various on-site clinics the data are presented in Table 4.12.

Table 4.12 Vaccines offered in occupational health clinics (n=74)

	Frequency	Percentage
Influenza	58	78%
Tetanus	49	66%
Hepatitis B	48	64%
Hepatitis A	38	51%
Yellow Fever	23	31%
Diphtheria	20	27%
Meningitis	20	27%
Typhoid	20	27%
Pertussis	17	23%
Pneumococcus	14	18%
Polio	14	18%
MMR	13	17%
Rabies	11	14%
Chicken Pox	9	12%
Shingles	2	2%

The data indicate that influenza vaccinations were being administered at 58 (78%) of clinics, followed by tetanus 49 (66%), hepatitis B 48 (64%) and hepatitis A 38 (51%). This was followed by yellow fever 23 (31%), diphtheria 20 (27%), meningitis 20 (27%), pertussis 17 (23%) and typhoid 20 (27%).

Respondents (n = 57) with in-house travel medicine clinics indicated that they offered the following services to their employees who travel for business purposes: Malaria prophylaxis 38 (67%), travel first aid kits 36 (63%), insect repellent 29 (51%) and other 16 (28%). Other was indicated as impregnated mosquito nets, malaria self-test kits and malaria treatment, i.e. artemether and lumefantrine. One respondent

indicated that in certain instances, risk dependant, a trauma bag would be provided and medication for altitude sickness. Condoms were also supplied.

4.7 DISCUSSION

This section discusses the research results obtained and presented in the previous sections.

- **Response rate**

A total response rate of 34% was achieved for this study which is an acceptable rate for an online survey according to Nulty (2009). The same author also found that face-to-face surveys do not necessarily fare better than electronic surveys and that smaller numbers of respondents often gave more meaningful information as opposed to larger numbers of respondents (Nulty, 2009). Cook, Dickson and Eccles (2009) conducted a survey of 350 healthcare professionals' response rates to postal and electronic surveys and concluded that there was a decline in response rates to both.

Online surveys are subjective to the respondents and are reliant on their access to and ability to operate electronic equipment. Sixteen questionnaires that were returned, but not completed, may indicate that these respondents were not conversant with electronic surveys and how to complete them. Some OHNPs may have felt that because they do not offer TM on site, that the survey was not relevant to them and therefore did not participate. Stringent corporate electronic security may also impede OHNPs from receiving this type of mail. Mailing the questionnaire was not an option for the researcher as the postal service in South Africa was on strike at the time.

In contrast to the response rate achieved in this study, a study conducted by Mutava in 2011 which investigated the perceptions of Central Gauteng OHNPs with regard to their traditional and expanded roles achieved a total response rate of 68% which is a high response rate for mailed questionnaires (Mutava, 2011).

A total response rate of 97% was obtained for a study conducted by Alberts (2014) on the work satisfaction of OHNPs in Gauteng and Mpumalanga which is a high

percentage for self-administered questionnaires according to literature. The high response rate was achieved by the researcher by administering the questionnaire in groups and collecting the questionnaires at the regional meetings.

- **Type of workplace**

The response from 154 (n=154) respondents indicated that the majority of OHNPs practised as private practitioners. This could be remuneration related. The second and third most workplaces cited by respondents were manufacturing, healthcare facilities and the mining industry. Whereas results from Mutava's study (2011) indicated that relatively few OHNPs worked in the mining and health care industries with the highest percentage working in the manufacturing industry.

The Police Service and Military were provided as an option; however, no respondents chose this option. This is a great pity as the South African military now forms part of an African peacekeeping force and it would have been interesting to know what preparation is done for deploying soldiers. A possible explanation could be that the OHNPs fall under the Pretoria group and therefore would not have been sent the questionnaires.

- **OHNP Qualifications**

The majority of the respondents (67%) in this study held a diploma in occupational health nursing, followed by (20%) with certificates in OHN. Similar findings were also evident from other studies such as Mutava (2011) and Alberts (2014).

Ten respondents were not qualified in OHN. Eight respondents chose no OH qualification and two left the question open. Seven of the ten respondents confirmed that their employees travel for work and specifically in Africa, and six confirmed training in travel medicine. Four work in health facilities, one works as a private OH practitioner and the remaining workplaces included engineering, metal recycling, retail and a chemical site. This is cause for concern as they are practising in this specialty and working outside of their professional scope of practice (SANC, 2015). It was confirmed with the SASOHN that although some members are not qualified in occupational health, they may register as SASOHN members; however, they do not

qualify for the indemnity cover for OHN practice (A Butcovich 2016, personal communication, 2 February).

OHN is registered with SANC as an additional qualification. The South African Nursing Council (SANC, 2015) cited the following information pertaining to countrywide OHN qualification - there are currently 278 female and 15 male professional nurses registered to practice occupational health nursing with a diploma.

A total of 1018 female and 102 male professional nurses are registered at the SANC to practice with a certificate in occupational health nursing. The certificate was phased out in 1993, and nurses had an opportunity to convert their certificates to diplomas. However it appears from the results that this opportunity has not been used maximally by OHNPs with only a certificate. In reviewing the 2014 SANC register it indicates that only 186 females and 18 males registered their diploma qualifications (SANC, 2014a). It is not known how many nurses updated their qualification from certificate to diploma.

The Certificate of Competence in Travel Medicine does not qualify to be registered as an additional qualification with SANC. It is considered to be a short course and as such SANC has no data available on nurses with this qualification. It is not known if OHNPs recognise the need for further studying in travel medicine and/or the reasons why they are unable to undergo training. In mitigation, it is often difficult for OHNPs to be away from the workplace to attend training as there is no-one to replace/locum for them, and organisations are loathe for the nurses to be absent from work. Time, cost constraints and workload also hamper OHNPs from studying as they often work alone. A study on lifelong learning or continued professional development of occupational health nurses may be of value in the future.

- **Profile of the participants and workplaces**

- **Gender**

Of those respondents who answered the question on gender, 141 (92%) were female and 13 (8%) were male. The female/male ratio is 10.85:1. This distribution of many more females is expected as it reflects the composition of the South African nursing population that has traditionally been predominantly female with fewer males as reflected in the SANC statistics (SANC, 2014b). In 2014 186 females and only 18 males registered with the SANC as OHNPs (ratio 10.3:1). The researcher was not able to get exact figures for 2016, from the SASOHN, however, when attending meetings it is obvious that female nurses greatly outnumber male nurses. Alberts (2014) discussed similar findings in her research, as did Mutava (2011). A possible reason can be attributed to social standing, pay and gender role stereotyping of the nursing profession. The gender profile of the respondents in this study reflects that of registered OHNPs on the SANC database.

- **Age**

The participants in this research were predominantly (41%) in the older age group of 46 to 55 years. The lack of younger OHNPs is an issue of concern as indicated by the small group (10%) of participants who were in the age group 20-35 years.

Similar results were demonstrated by Mutava who found the predominant age group of OHNPs to be 40 to 49 years (46%) and the age group 20 to 29 to have the fewest participants (2%) (Mutava, 2011). It appears that relatively few young adults are employed in the field of OHN. This may be due to the fact that when nurses complete their basic nursing training, they work as general nurses before they move into specific areas of specialisation.

Due to the lack of statistics it is not known how many new, younger nurses are entering the occupational health nursing field. This means that there is no younger generation to fill the gap when older nurses retire. The knowledge, skills and

experience of the older nurses working as OHNPs will be lost, adding to the shortage of skilled nurses within the occupational health field (Michell, 2011).

- **Years of OHN experience**

The fact that a third of respondents indicated that they have been working in OH for more than 15 years, demonstrates that the respondents have a substantial amount of experience in the speciality. Experience is also related to age, so more experience also raises concern, as many OHNPs with experience may be close to retirement age and without an overlapping period and replacement by younger nurses, the wisdom will be lost (Michell, 2011).

- **Travel / employee information**

The results demonstrate that the many workplaces in which OHNPs are employed have employees who travel inside and outside the borders of South Africa for work purposes. These findings can be attributed to the expansion of businesses and companies to other countries and globalisation. This is also confirmed by The Consultancy for Africa Intelligence estimates that in 2013 the illegal immigrant figures have increased to 5 million (Consultancy for Africa Intelligence, 2013).

Based on the response regarding employees who travel for work purposes, namely 35% of respondents that employees travelled regularly within RSA borders, 46% on short term business outside RSA borders and 24% for longer than six months outside RSA borders, it is clear that preparation for occupational travel should be included in occupational health services. Since 85% of respondents indicated that employees travel for work to destinations in Africa, training and provision of travel health should be particularly orientated to those who travel in Africa. A further need for such training is related to the finding that 58% of respondents indicated that their place of work is employing people from countries other than South Africa and the employees originate mainly from African countries.

The majority of respondents indicated that travel medicine should be part of OHN practice and they strongly agree that doing so would add value to their occupational

health practice. They also indicated that they had time to offer travel medicine services. This contrasts with the results of a study conducted over twenty years ago when a third of respondents thought that travel health was not a function of occupational health services (Ross & Kocks, 1995).

- **Education in travel medicine and membership**

A small portion of respondents had or were waiting for a Certificate of Competence in travel medicine and all were members of the South African Society for Travel Medicine (SASTM). Currently certification for nursing practitioners to provide travel health services is only available through the University of the Witwatersrand, in conjunction with the SASTM on an annual basis in Gauteng. There has been an increasing uptake of the course by occupational medical and nursing practitioners over the 15 years that the course has been offered (M. Ross 2016, personal communication, 28 January). However, although the venue may not be as much of a deterrent for those in Gauteng as for other provinces, the cost and potential perceived lack of need by employers could affect the numbers of OHNPs taking the course.

A much larger proportion of OHNPs reported that their OMP has a Certificate of Competence in travel medicine which would enable the occupational health clinic to provide yellow fever vaccinations. This is important since the practice of travel medicine by OHNPs requires the supervising OMP to be certified and for this reason OHNPs entry to the training course requires that the OMP be certified or registered for the course simultaneously.

For OHNPs to dispense medicines such as malaria chemoprophylaxis, a valid dispensing licence is required. In addition, the DOH will issue a yellow fever licence only with proof of a valid dispensing licence.

- **Knowledge of travel medicine**

The findings reveal that OHNPs who participated in this study are knowledgeable about the meaning of travel medicine. This finding is further supported by 117 nurses responding to this question. Statements that describe travel medicine were provided.

All of the statements describe travel medicine. OHNPs indicated that vaccinations were the most important component of TM and this was followed by disease prevention, pre-travel assessment, health education, fitness to travel and decreasing health hazards.

A small number of OHNPs responded that they were already offering travel medicine services in their practice and the majority were referring to external travel medicine service providers. This indicates that OHNPs are aware of their expanding role to accommodate TM within their OH service and that TM in general is expanding within South Africa. It further indicates that nurses have a moderate understanding of health risks related to travel.

Occupational health nurse practitioners appear to be relatively well versed in some aspects of malaria prevention, yellow fever and meningococcal vaccine (for travel purposes) administration. In determining their knowledge on vaccine preventable diseases it was found that nurses indicated that dengue and malaria were vaccine preventable. This is not correct. Having knowledge of malaria and vaccine preventable intervention is vital as many OHNPs indicate increased travel within Africa and these are all endemic diseases that can be prevented.

- **Attitude toward travel medicine**

Although not all participants answered this section of the questionnaire (between n= 108-111) those who did respond indicated a favourable attitude to the statements. The fact that more than half of the respondents confirmed that travel medicine should be included in OHN education and that they wanted to learn more about travel medicine indicates an awareness of the need for travel medicine and further training, but is not reflected in their qualifications.

Respondents (61%) agreed that travel medicine is a future role for OHN practice, while (54%) strongly agreed that they wanted to learn more about travel medicine and (49%) strongly agreed that a travel medicine module should be included in OH training.

Very few respondents indicated that they strongly disagreed that travel medicine should be included in occupational health practice or OHN training and that TM is not a future role for OHNPs. Further analysis showed that these respondents were in fact working in travel medicine clinics and health care facilities. It could be speculated that travel clinic nurses wanted to protect their jobs and that OHNPs in health facilities had other tasks over and above OH and therefore did not have time to offer travel medicine services.

Mutava (2011) found that OHNPs spent 39.7% of their time managing an occupational health service followed by health promotion activities (16%), education activities (14%), workplace assessments (12%) and research-related activities were regarded as taking the least of their time (9.7%).

While the overwhelming interest in travel medicine supports the inclusion of basic travel health as a component of post graduate level of OHN training, post graduate training in travel medicine is essential for those who practise travel medicine.

- **Practice information**

Respondents indicated that vaccination was very important in travel medicine. The data indicate that influenza vaccinations were being most frequently administered at clinics, followed by other vaccinations, most of which are required for working in African countries.

In-house provision of travel medicine related items such as malaria prophylaxis, self-test kits, impregnated mosquito nets and other risk based items including first aid kits, trauma bags, condoms and altitude sickness medication were provided.

4.8 SUMMARY

This chapter presented the findings of data collected from OHNPs in diverse occupational health settings in the Gauteng Central district.
The chapter began by discussing the response rate and the reliability of the research instrument that was used. Research findings were then discussed and findings are presented in tabular, graphic and written form.

CHAPTER FIVE

CONCLUSIONS, LIMITATIONS, RECOMMENDATIONS AND PROPOSALS

5.0 INTRODUCTION

This chapter concludes the research by exploring the significance of the findings and their implications to OHN practice. The chapter also discusses the limitations of the research and highlights recommendations for future research, occupational health nursing education and practice.

5.1 CONCLUSIONS FROM THE STUDY

A cross sectional study was conducted in 2015 amongst occupational health nurse practitioners in the Central Gauteng region.

The study contributed to the body of knowledge of occupational health nursing and occupational health and travel health and medicine. In addition, an awareness of travel medicine within occupational health and occupational health nursing fields was created.

The conclusion is based on the research objectives and research questions.

Research objective 1: Knowledge, attitudes and practices related to travel medicine and health.

Occupational health nurse practitioners who participated in this study, demonstrated knowledge of the meaning of travel medicine, malaria prevention and some vaccine preventable diseases. However, knowledge was lacking with regard to vaccinations, the frequency of yellow fever boosters, the use of meningococcal vaccine in occupational settings and the fact that some OHNPs indicated that there was a vaccine available for malaria and dengue.

A favourable and positive attitude was displayed with regard to the inclusion of travel health and medicine in occupational health nursing practice. According to occupational health nurse practitioners, travel medicine and health should be part of the OHNP's roles and role activities and a module on travel medicine should be included in occupational health nursing education. OHNPs also want to learn more about travel medicine and are of the opinion that value can be added to OHN practice by providing travel health services.

Research objective 2: The nature and extent of travel health and medicine within occupational health services in the Central Gauteng district.

It is evident that travel medicine services are offered to a limited extent in-house in some occupational settings in the Gauteng area. The interventions that are offered are pre-travel assessments, health education, malaria prophylaxis, travel first aid kits and insect repellent. Vaccinations that were most frequently given are influenza, tetanus, hepatitis A and B.

Many Gauteng workplaces have employees/workers who travel to other countries and some employ workers from other countries, mainly from Africa. Therefore, knowledge of travel medicine will add value to the occupational health nursing practice in the primary preventive and promotive, as well as secondary levels of prevention.

Travel medicine is a future role for OHNPs as it is part of a comprehensive wellness/health promotion programme. As the vast majority strongly agreed that they want to learn more about travel medicine, a module should be included in the education curriculum of OHNPs.

5.2 LIMITATIONS OF THE RESEARCH

The research did have its fair share of limitations, but it has nevertheless revealed some comparative data, albeit small, on OHNPs' knowledge, attitudes and practice of travel health and medicine.

The research was restricted to the Central Gauteng district. It also restricted the participating OHNPs to three branches of the SASOHN. This meant that the participation of other OHNPs in other regions was excluded. Thus findings can neither be generalised to other SASOHN members nor to those of the RSA OHNPs. Inferences from the research can only be made tentatively.

Of a possible 492 OHNPs, only 170 respondents participated in the research, further limiting the generalisability of the results.

On reflection of the study the researcher realised that the questionnaire was too long and thus maybe a contributory factor to the relatively low response rate.

Only questionnaires were used to collect data and therefore no triangulation took place. Information collected through focus groups or personal interviews could have added richer information to the collected quantitative data.

5.3 RECOMMENDATIONS AND PROPOSALS

The recommendations emanating from this research are made with regard to occupational health nursing education and practice as well as research.

Occupational health nursing education

Based on the findings of this research it is recommended that a module on travel health and medicine should be included in all occupational health nursing curricula.

A credit bearing module on travel health and medicine should be included in the occupational health nursing curriculum or provided as a selection course.

OHNPs who wish to further their formal education in travel health and medicine should be given credit for the module, which is to be obtained from the University of the Witwatersrand School of Public Health.

It is recommended that the SASOHN include research findings in the field of occupational health nursing to be disseminated and discussed at the society's various activities.

Research

It is recommended that similar research needs to be conducted in other regions in Gauteng and parts of the RSA for a national comparison and determination of need.

It is evident from the literature review that limited studies have been carried out on travel medicine and travel health within occupational health nursing practice and therefore the researcher recommends that more studies related to the topic be undertaken.

Occupational health nursing practice

Occupational health nurse practitioners should be encouraged to participate in research.

It is recommended that OHNPs include aspects of travel medicine and health into a comprehensive workplace health promotion/wellness programme as is relevant to the particular workplace and based on the needs of workers.

As indicated by the findings of this research, future research prospects should focus on conducting similar research in other regions in Gauteng and parts of the RSA for a national comparison. This research, although small, contributed to the body of knowledge of the knowledge, attitudes and practice of OHNPs in an RSA context.

5.4 CONCLUSION

In view of the fact that limited research has been done in the South African context on OHNPs and their role related to travel health and medicine, the researcher embarked on this research in an endeavour to investigate the knowledge, attitudes and practices of OHNPs within their OH practice.

Travel medicine is a future role for OHNPs as it forms part of a comprehensive wellness/health promotion programme. As the vast majority of participants strongly agreed that they wanted to learn more about travel medicine, a module should be included in the training of OHNPs. Post graduate training in travel medicine should be encouraged and recognised.

The overall outcome of the research demonstrated some deficits in the OHNPs' knowledge, attitudes and practice of travel health and medicine. It was strongly agreed that this should be a future role for OHNPs and that a module should be included in the training of OHNPs.

Humans have travelled since time immemorial and this activity has influenced disease patterns which in themselves have shaped history. The researcher is of the opinion that based on the volume of occupational and leisure travellers the needs of these travellers need to be identified and all nurses, in particular occupational health nurses, require this knowledge to better prepare the traveller prior to and on return from a host country. The researcher believes the research findings will help create an awareness of travel health and medicine.

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