THE PERCEPTIONS, ATTITUDES AND HEALTH SEEKING BEHAVIOUR OF NURSING STUDENTS AT A UNIVERSITY IN THE WESTERN CAPE REGARDING INFLUENZA

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A thesis submitted in fulfilment of the requirements for the degree of Masters in Nursing at the University of the Western Cape

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DECLARATION

I declare that "**The perceptions, attitudes and health seeking behaviour of nursing students at a university in the Western Cape regarding Influenza**" is my own work that it has not been submitted before for any degree or examination at any other university and that all the sources I have used or quoted have been indicated and acknowledged as complete references. I declare that I have no competitive interest in any of the companies that manufacture any of the tests used in this study. No shares and or stocks are held, nor will I have any financial gain or loss with the publication of any manuscript and articles pertaining to this research.

Fatma Omar Ramadan

Student number: 3500038   Date: April 2018

Signed:

DEDICATION

I dedicate this study to my parents, my sister and brothers. Also, I dedicate this thesis to my husband, Omar and my little lovely boy, Sanad.

ACKNOWLEDGEMENTS

It is by the grace of Allah that I was able to have the strength that I needed to carry me through my study and for that I give my praises to Allah and to him I will forever be grateful for the guidance in the completion of my Master's.

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ABSTRACT

According to Brown (2010), influenza kills and hospitalises thousands of people every year, about thirty-five thousand and two hundred thousand respectively. Some studies have shown that one of the major reasons that people do not take part in preventative behaviour concerning influenza would be some misconceptions and lack of knowledge.

The purpose of this study was to investigate perceptions and attitudes of nursing students at a University in the Western Cape about influenza and their prevention and health seeking behaviour against influenza infection. This topic is important as nursing students are a part of the population group that is frequently exposed to influenza, either at their institutions of learning or in the hospitals and clinics, where they come into contact with patients in their roles as health care workers.
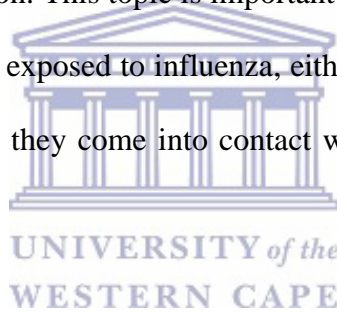
A comprehensive review of the literature around perceptions and attitudes and health seeking behaviours regarding influenza was undertaken and considered by the researcher. Most of the literature reviewed came from Western countries as not much research has been done in Africa on the topic. From the literature reviewed, the researcher decided to use the Health Belief Model as a conceptual framework for this study as it has proven to be relatively effective in previous studies of this nature as well as in predicting people's health seeking behaviours.

A cross-sectional study was conducted among nursing students. The study followed a quantitative approach, with a descriptive survey design where the respondents completed a self-administered questionnaire. The questionnaire was designed in line with the Health Belief Model

and through it the researcher was able to gather nursing students' perceptions and attitudes regarding influenza against selected Health Belief Model constructs.

The results were analysed and examined to provide insight on the perceptions of the nursing students towards influenza from which recommendations were made to aid in the education of nursing students on benefits regarding influenza vaccination, which could lead to an increase in vaccine uptake. There were two statistically significant differences in this study which are in cues to action scores for the four ethnic groupings ($F (3, 523) = 4.484$, $p=0.004$) and in respondents' perception of barriers towards uptake of influenza vaccination score was observed for the four ethnic groups ($F (3, 501) = 3.386$, $p=0.018$). Recommendations on the possible increased use of social media to spread information about influenza were made as well as some suggestions for future research, such as investigating at which point of their education the nursing students learn about influenza in class and how different financial statuses of individuals might have an effect on their health seeking behaviour.

KEY WORDS

Attitudes, Barriers, Behaviour, Health Belief Model, Health Seeking Behaviour, Influenza, Nursing students, Perceptions, Severity, Vaccination.

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CHAPTER 1: OVERVIEW OF THE STUDY

1.1 Introduction

Influenza (flu) is a contagious respiratory illness that infects the nose, throat and lungs (World Health Organization [WHO], 2016), and is a global health issue. The influenza virus is usually most prevalent in the winter months in South Africa usually starting in the first week of June, although this sometimes fluctuates. It is widely spread by respiratory droplets, for example, from sneezing and coughing, or by touching surfaces that other people who have the virus have touched. It can also spread more easily in closed communities such as schools, work places and institutions. These droplets can then find their way into the mouths or noses of people who are close by. Therefore, general preventative precautions should be taken, such as having the flu vaccine annually, frequent hand washing, cough hygiene, while avoiding contact with people who are ill should also be considered.
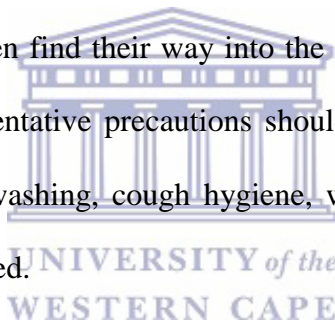
Nursing students are health care workers (HCWs), who are at high risk of exposure to seasonal influenza while providing direct patient care during their clinical placement (Cheung, Ho & Lam, 2017). When seasonal influenza spreads to a global level and develops into a new virus by undergoing genetic changes, it can result in an influenza pandemic against which humans lack immunity (World Health Organization [WHO], 2011) and often seek health care. Health seeking behaviour is defined as an action undertaken by individuals who perceive themselves as having a health problem or to be ill for the purpose of finding an appropriate remedy (Klemenc-Ketis & Kersnik, 2014)

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El Kahi, AbiRizk, Hlais and Adib (2012) state that health seeking behaviour could be broken down into 3 categories: formal, when professional help was sought from health care services and/or health care providers (physicians, psychologists); informal relational, when help was sought from members of the student's social network (parents, friends, teachers, trusted persons); and informal personal, when young people resorted to self-medication or browsed the Internet or read self-help books.

Afolabi, Daropale, Irinoye and Adegoke (2013) argue that understanding heath seeking behaviour is crucial in the development of health system policies and further argues that there are several factors that can be used in understanding health seeking behaviour.

Health seeking behaviour in this study referred to health and hygiene care by university nursing students in protecting themselves against the influenza virus in their work place.
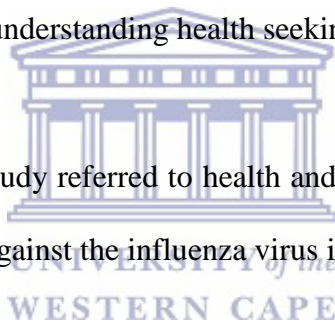
1.2 Background

Annually there are 3 to 5 million reported cases of influenza globally, of which 250 000 to 500 000 deaths are recorded (WHO, 2016). Meng, Liao, Suen, O'Donoghue, Wong and Yang (2016) describe influenza "as one of the most contagious respiratory infectious diseases in the world". Existing studies concur that influenza is associated with high morbidity and mortality and can cause mild to severe illness and death in severe cases (Engelkirk, Duben-Engelkirk & Burton, 2011). Influenza viruses are among the most common causes of human respiratory infections (Wright, Deatly, Karron, Belshe, Shi, Gruber, Zhu & Randolph, 2007).

There is a significant body of literature on the influenza pandemic with the majority of the data emanating from America, Asia, Europe and Australia (Katz, Schoub, Heraud, Breiman, Njenga & Widdowson, 2012). Existing research shows that influenza cases are well documented in developed countries (Katz et al., 2012). This is not surprising given the fact that developed countries have higher incomes and thus they tend to spend more on disease control and research.

In Africa, the research outlook of the influenza virus has been bleak until recently, when research started gaining momentum. In the developing world, when compared to middle-income and high-income countries, the epidemiology and burden of the influenza virus are not well documented (Feikin, Ope, Aura, Fuller, Gikunju, Vulule, Ng'ang'a, Njenga, Breiman & Katz, 2012). In line with this argument, Katz et al. (2012) states that "there has been minimal effort in Africa in understanding the epidemiology, burden and seasonality of the virus". This is partly due to the fact that the region is affected by a myriad of other leading killer diseases and when influenza is compared to the effects of HIV infection and malaria, the impacts of the influenza virus might seem negligible (Katz et al., 2012). Despite this lack of adequate data, existing evidence shows that the influenza infection has a significant impact on morbidity and mortality in Africa (Katz et al., 2012).

Health care workers are particularly susceptible to influenza infection as they are exposed in both the general community (household contacts, public transport) and the workplace (Centre for Disease Control [CDC], 2013). Proximity to patients and a constant flow of visitors and co-workers may increase the risk of infection (CDC, 2013).

Hospital acquired infections have generated a great deal of concern globally and pose a significant threat to population health (Fauci, 2006). Nursing students worldwide are present in all health care settings and can play a key role in preventing hospital acquired infections by modelling and promoting evidence-based infection control practices which will ensure the continuation of quality care for patients.

Nurses globally have hands-on contact daily with their patients and therefore play a vital role in patient safety and infection control. Nursing students are also key players in the fight to ensure the ongoing implementation of infection control practices. It is the responsibility of nurses, including nursing students, to keep the patients in their care safe by modelling effective and frequent hand washing practices. The CDC explains how hand washing is the single most effective way to prevent the spread of infection. In this regard, one of the actions needed by nurses to manage H1N1 influenza is frequent hand washing. Nursing students therefore need to have a proactive voice in the promotion of current best practices for hand washing hygiene. Nursing students globally can take a leadership role in all healthcare settings to foster an organisational culture that promotes and reflects a strong obligation to patient safety through the prevention of nosocomial infections.

In South Africa, nursing students are placed in different health care institutions such as clinics and hospitals for their practical clinical learning. The students are normally placed in healthcare settings such as Midwife Obstetrics Units (MOU), Community Healthcare Centres (CHC), clinics and hospitals. While doing their practical learning they are effectively practicing health care workers and in this capacity, they are directly exposed to influenza on a daily basis.

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Influenza vaccination is another primary method for preventing influenza and its severe complications (CDC, 2015; WHO, 2016). CDC (2015) states that there is a need for an annual adjustment to the influenza vaccines due to the genetic changes that have been witnessed in the influenza virus over the years. This is supported by the genetic differences evident in the influenza A(H3N2), A(H1N1) and influenza B viruses.

The Advisory Committee on Immunisation Practices (ACIP) for the 2016-2017 influenza season recommends annual vaccination of persons at high risk for influenza-associated complications as the most effective way to reduce the effects of influenza (CDC, 2016). ACIP also recommends annual vaccination of persons in frequent contact with persons at high risk of contracting influenza to reduce the chance of transmission to such persons (CDC, 2016). Many institutions recommend that health care workers be routinely vaccinated against influenza to reduce the occupational risk of infection and to prevent the transmission of the influenza virus. In support of this, Ottenberg, Wu, Poland, Jacobson, Koenig, and Tilburt (2011) state that mandatory vaccination against influenza for health workers is a procedure that is supported by scientific data as well as ethics and is within the legal framework.

This study therefore seeks to investigate the perceptions, attitude and health seeking behaviour of university nursing students in South Africa towards influenza infections, primarily at a university in the Western Cape.

1.3   Problem statement

Influenza is an adverse respiratory illness or a serious respiratory disorder that poses significant threats to students in institutions of learning. Nursing students are particularly susceptible to the influenza infection as they are exposed in both the general community (household contacts, public transport etc.) and place of study, both university and health care settings. Proximity of students to patients who have the influenza virus may further increase the infection risk. It is therefore important for nursing students to protect themselves during the influenza season. Despite the morbidity and mortality associated with the influenza virus, there is limited data on reported cases in most African countries and South Africa is no exception. Murray, Cohen, Walaza, Groome, Madhi, Variava, Kahn, Dawood, Tempia, Tshangela and Venter (2015) concur that there is a scarcity of data on the burden of the influenza virus, which in turn translates to poor policy implementation in pandemic preparedness for the virus, as there is insufficient data to identify high-risk profiles of the virus in the country. Data on nursing students' perceptions and attitudes towards the influenza virus and their preventative action against it are also not known. This study therefore seeks to determine the perceptions, attitudes and health seeking behaviour of nursing students towards influenza, and their prevention and action against influenza based on the health belief model.

1.4   Significance of the research

It is vitally important to prevent the spread of influenza among nursing students as they often come in contact with other students and workers who are infected with the influenza virus.

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As shown in the literature review, not much research had been done around the subject in African countries. This study aimed to contribute to the knowledge base that currently exists with regards to the perceptions, attitudes and health seeking behaviour around influenza as well as to provide baseline information that could indicate and motivate more research in this topic. The information from this study could be used to see how the existing protective measures against flu by nursing students can be improved and potentially, this could contribute in cutting financial costs related to high absenteeism from university and work due to ill health.

This research could be used to highlight the importance for nursing students to protect themselves from the spread of influenza during the winter season.

The fact that South Africa is highly diverse in terms of the socio-economic backgrounds of its population means that people are exposed to various types of risks of contracting the virus and as a result, certain people are more at risk than others. An understanding of the perceptions, attitudes and health seeking behaviour of different people towards influenza could be beneficial in encouraging people to get vaccinated and to take other preventative measures such as hand washing and avoiding crowded areas.

1.5 Aim of the study

This study aimed to investigate the perceptions and attitudes of nursing students at a university in the Western Cape about influenza and their prevention and health seeking behaviour against influenza infection.

1.6 Research objectives

The objectives of the study were to:

- Determine nursing students' perceptions and attitudes about the severity, susceptibility and risk of influenza

- Assess nursing students' perceptions about perceived benefits and barriers to the influenza vaccination

- Identify nursing students' cues to action and determine the relationship between demographic and attitudinal variables and nursing students' intention to receive the influenza vaccination.

1.7 Research questions

- What are the perceptions, attitudes and behaviours of nursing students regarding the influenza virus?

- What preventative measures do university nursing students take against influenza infection?

- To what extent do nursing students take vaccination against the influenza virus?

- Are there differences between attitudes, perceptions and behaviours based on gender, age, ethnicity and level of education (Foundation 1 & 2; Bachelor Nursing 1, 2, 3 & 4) between nursing students?

1.8 Operational Definitions

Health belief model (HBM): one of the most widely recognised conceptual frameworks of

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health behaviour, focusing on behavioural change at the individual level (Green & Murphy, 2014). The HBM one of the most popular theories used in understanding health and illness behaviors (Mo & Lau, 2015). In this study, the term refers to the belief that if nursing students' perceptions that the benefits of the vaccine outweigh the barriers and threats, they would be more likely to seek preventative action.

Influenza Vaccination: is a safe and effective means to prevent the spread of different strains of the influenza virus (Wallace, 2015). In this study, influenza vaccination was regarded as a preventative measure.

Influenza virus: refers to the three types of viruses, A, B and C. A and B are mainly responsible for epidemics of respiratory illness that occur almost every winter and are often associated with increased rates of hospitalisation and fatalities (CDC, 2016). The prevention against this virus was the focus of this study. The words influenza and flu are used interchangeably.

Preventative action: Raj (2016) defines preventative action as "action to eliminate the cause of a potential non-conformity or other undesirable situation". In this study, it referred specifically to the precautionary steps taken by university nursing students on a daily basis in their workplace and at the university to avoid and combat the spread of the influenza virus.

1.9   Research methodology

Research methodology refers to the procedures by which researchers go about their work of describing, explaining and predicting phenomena (Rajasekar, Philominathan & Chinnathambi,

2013). It provides the plan on how the research will be conducted. The methodology of this research will be discussed briefly here and in more detail in Chapter 3.

1.9.1 Research approach and design

This is a cross sectional study and the researcher took on the quantitative approach with a descriptive design to conduct this study. A quantitative approach is an approach researchers take when they want to have the ability to analyse the data in terms of numbers (Hughes, 2012). Quantitative research can be defined as research that explains phenomena according to numerical data which are analysed by means of mathematically-based methods, especially statistics (Kurniasari, 2018).
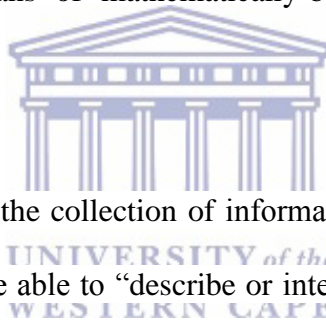
The descriptive design focuses on the collection of information "about prevailing conditions or situations". The aim of this is to be able to "describe or interpret the data" (Salaria, 2012). This design was chosen as the researcher was not only looking to collect numbers, but also to be able to interpret and analyse the data, make comparisons and check for trends or relationships in the variables (Salaria, 2012).

1.9.2 Research Setting

The research setting is the environment used to conduct the study. This study was conducted among undergraduate nursing students in the school of nursing at a university in the Western Cape.

The university in the Western Cape attracts students from diverse backgrounds, as people of different religions, race and age can be found pursuing their studies here, together with a mix of international students. In addition, the university has many different faculties such as Community and Health Sciences and Economics and Management Sciences, to name a few.

The School of Nursing falls under the Faculty of Community and Health Sciences and is one of the largest nursing schools in Africa, offering a Bachelor of Nursing degree with an undergraduate student population of approximately 1, 053 students from diverse backgrounds.

1.9.3   Study population

Wood and Haber (2006) define a study population as "a well-defined set that has certain specified properties". In this case, the study population included 1 053 under graduate students in the School of Nursing at a university in the Western Cape.
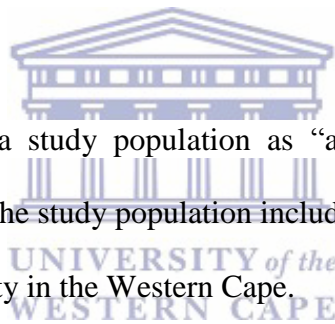
1.9.4   Sampling and sample size

Sampling is defined as the number of population units that will be used in the research study (Phrasisombath, 2009). According to Phrasisombath, probability sampling is the most accurate sampling method to use with quantitative research, hence the sample size for this research study was calculated using proportional probability sampling to arrive at a sample size of 527, which is 50% of each level of study.

1.9.5   Data Collection Instrument

Data was collected using a questionnaire (APPENDIX 1) developed by the researcher. The development of the instrument was influenced by the Health Belief Model and existing literature on the phenomena of interest.

1.9.6   Validity and Reliability

According to Kimberlin and Winterstein, (2008), measurement can be defined as the use of numbers to quantify phenomena. They further state that the extent to which an instrument can measure what it is supposed to measure can be defined as its validity. In this research study, face validation and content validation were used to check the validity of the data collection instrument.
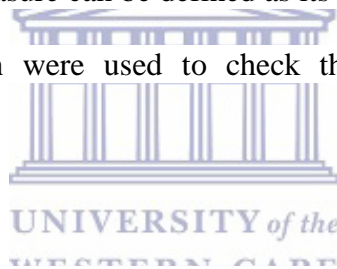
Validating a measuring instrument helps to reduce errors in the measuring process and there many different means that can be used to reduce these errors, thereby increasing the reliability of the instrument. Reliability refers to the "consistency within the analytical procedures" (Noble & Smith, 2015), whereby reliability estimates are used to give an indication of how reliable the instrument is. In this study, the questionnaire was pre-tested with a group of 31 nursing students at the university in the Western Cape. The Cronbach Alpha test as suggested Gray, Grove and Sutherland (2017) also used in this study and a Cronbach Alpha of 0.8 indicated that the instrument was reliable.

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1.9.7 Data collection process

➢ The researcher conducted a pre-test to check the validity of the questionnaire. After the pre-test of the questionnaire was completed and corrections were made to the questionnaire, appointments were made by researcher with the co-ordinators of each level of the programme to request access to the students before or after the class sessions.

➢ After a date and time had been established, the researcher went to the various classes to conduct a briefing session with the students. However, because it was close to the end of the study year, most of the students were not attending the class sessions regularly. The researcher had to re-strategize and recruited students while they were arriving at the School of Nursing or when they left the class. The study was explained in detail. The data collection took a month and three days (between November and December 2017). A date and time for data collection were established. On the day of data collection, the researcher obtained written informed consent from the students before the questionnaires were distributed to the consenting students. The researcher answered any questions from the students about the questionnaire. The completed questionnaires were collected by the researcher directly after they had been completed.

1.9.8 Data analysis and interpretation

The data collected in this study was analysed using SPSS Version 24 after it had been coded by the researcher in a code book. Coding and the use of a codebook allowed the researcher to keep numerical values of the variables. Descriptive univariate and bivariate statistical analysis were

used in analysing the data and the data was presented in tables and graphs.

1.10 Ethics statement

The Humanities and Social Sciences Research Ethics Committee (HSSREC) provided the ethics approval for this study with reference no. HS17/9/7 (APPENDIX 2). When it comes to the ethics involved in research studies, the researcher should protect the dignity of the respondents when publishing the information that is collected from the research (Marianna, 2011). Marianna (2011) further states that consent is a major ethical issue concerning research and the researcher made sure that the respondents gave their consent by signing consent forms before taking part in the research study. Also, none of the research respondents were asked for their names to ensure anonymity and the questionnaires were only accessible to the researcher. Both the anonymity and confidentiality of the research subjects were taken into consideration, as according to Shah (2011), one of the most important aspects regarding ethics in research would be maintaining the confidentiality of the research subjects.

1.11 Conclusion

This chapter has provided an overview of the research study which includes introduction, background, problem statement and significance of the study. The chapter further outlined some important details of the study such as the aim, objectives, research questions and operational definitions. This chapter also briefly described the research methods, which were used by the researcher to conduct the study.

The next chapter presents the literature review and the conceptual framework. Chapter 3 focuses on methods and materials used to collect the data for the study while Chapter 4 is a presentation of the results pertaining to the study's objectives. Chapter 5 is the discussion of the results of the study while Chapter 6 presents the conclusions and recommendations of the study.

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CHAPTER 2: THE LITERATURE REVIEW

2.1 Introduction

According to Blaxter (2010), a literature review is defined as a "systematic, clear and proportionate method of identifying, evaluating and synthesizing the existing body of completed and recorded work produced by researchers, scholars and practitioners".

This chapter provides a discussion on the background of influenza, influenza epidemiology, treatment and management. A summary of the major myths about influenza has also been provided with a special focus on those surrounding the vaccine. The chapter also provides a brief overview of some studies regarding the attitudes of nurses and health care workers (HCW) concerning the flu vaccination. Lastly, the chapter provides the summary of the Health Belief Model which has been selected as the conceptual framework.
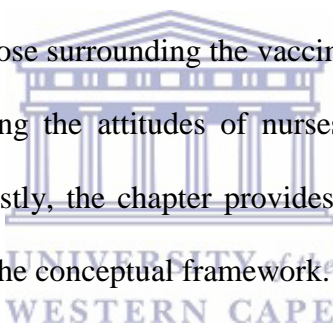
2.2 Background

Influenza is defined as acute viral respiratory infection that infects the nose, throat and lungs and affects millions people around the world (Rybicki, 2015). Globally, it is considered to be a health issue and typically occurs annually, more so during the winter months. Epidemics are usually reported from November to March in the Northern Hemisphere and May to September in the Southern Hemisphere (Fuhrmann, 2010).

Meng, Liao, Suen, O'Donoghue, Wong and Yang (2016) described it as one of the most contagious respiratory infectious diseases in the world which is associated with high morbidity

and mortality rates and causes mild to severe illness and death in severe cases (Engelkirk, Duben-Engelkirk & Burton, 2011). Influenza is regarded as one of the main causes of sickness and death around the world (Ginsberg, Mohebbi, Patel, Brammer, Smolinski & Brilliant, 2009). It is considered to be one of the major infectious diseases confronting the world today and competes with pneumonia as one of the leading causes of death in the United States. Further research has been encouraged on this viral infection as the origins of virulent strains as well as the behavioural patterns of influenza epidemics are still unexplored and unknown. In addition, the unpredictability of the constant emergence of new strains of influenza proteins are a serious cause for concern as it poses significant problems for public health-based control programmes throughout the world (Ginsberg et al., 2009). One of the major issues concerning influenza is that it is often confused with the common cold, especially during the early stages of infection.
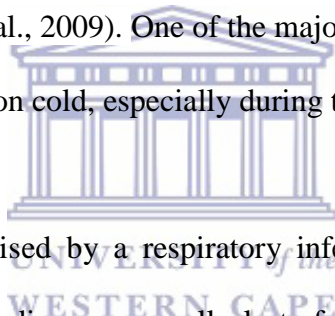
Influenza is specifically characterised by a respiratory infection accompanied by headaches, fevers, and short dry coughs. The disease normally lasts for up to a week, but infection may prove to be dangerous in the very young and the elderly as well as those with chronic health issues. The elderly are predisposed to infection due to a lower level of resistance and are consequently more susceptible to influenza and its complications. "Influenza can become a severe disease especially in the very young, heavy smokers, immune-compromised people and elderly" (Rybicki, 2015). The disease spreads rapidly in crowded environments and thrives in cold and dry weather, resulting in seasonal epidemics in temperate areas (Van Kerkhove, Vandemaele, Shinde, Jaramillo-Gutierrez, Koukounari, Donnelly, Carlino, Owen, Paterson, Pelletier & Vachon, 2011). This is usually during the four months of winter (May to August) in South Africa but may be extended to the first month of Spring (September) (McAnerney, Cohen,

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Moyes, Besselaar, Buys, Schoub & Blumberg, 2012).

2.2.1   Origins of Influenza

Influenza has been in existence for thousands of years. According to Reperant, Rimmelzwaan and Osterhaus (2014), it has been suggested that humans possibly acquired influenza when exposed to the domestication of animals. Due to the development of agriculture and the formation of permanent settlements, conditions such as the availability of potential hosts allowed for the spread of an influenza epidemic (Reperant, Rimmelzwaan & Osterhaus, 2014). The term influenza was first coined in the mid-1700's by an Italian, in reference to a disease resulting from polluted air. In terms of its actual origins, it is thought to have emerged approximately 6 000 years ago but was not isolated until 1933 by three British researchers Wilson Smith, Christopher Andrews and Patrick Laidlaw (Nitsch-Osuch & Brydak, 2014).
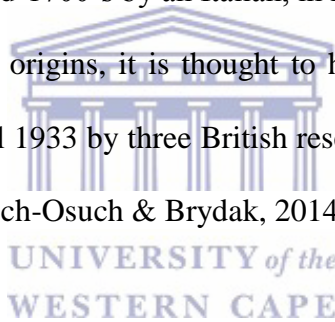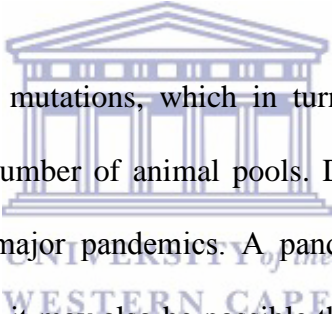
2.2.2   Biology of the Influenza Virus

The constant emergence of influenza viruses from the environment has many different sources which include avian (migratory waterfowl, domestic poultry) and mammalian (swine and sea mammals) (Zimmer & Burke, 2009). Even though the influenza virus evolves constantly into newer stronger strains, its clinical characteristics and aspects remain largely unchanged. The human influenza virus has the ability to evolve rapidly via one of two major mechanisms, namely antigenic shift and antigenic drift. An antigenic shift occurs when there is genetic re-assortment between "a human and a non-human virus in a non-human host", whereas antigenic drift refers to the accumulation of mutations that enable circumvention of the host's immune

response (Saglanmak, Andreasen, Simonsen, Mølbak, Miller, & Viboud, 2011).

The re-assortment of viral genomes occurring within animals is comparable to the genetic equivalent of the recombination in eukaryotic cells. This is considered a central mechanism of antigenic variation. A pair of viral genes code for two surface glycoproteins, haemagglutinin (H) and neuraminidase (N), are the critical antigens against which the host is able to develop immunological defences (Saglanmak et al., 2011). To date, more than thirteen H and nine N subtypes have been discovered, mostly occurring in avian hosts, particularly waterfowl, whereas Types H1, H2, H3, N1, and N2 have been positively correlated with human epidemics.

With major epidemics come new mutations, which in turn produce slight but accumulative antigenic variants within a large number of animal pools. During 1918, 1957, and 1968, new viral subtypes emerged, causing major pandemics. A pandemic is defined as a "worldwide epidemic". However, for influenza, it may also be possible that a new major subtype containing new H and/or N antigens has emerged (Saglanmak et al., 2011). These shifts are much more rapid than the slower genetic drift of other subtypes, resulting in the rapid spread of the virus as humans are unable to efficiently develop immunity against the new virus (Reperant et al., 2014).

It has been suggested that potentially pandemic influenza strains may have developed as a result of the recombination with viruses from animal pools. Thus far, virus subtypes have been discovered in wild and domesticated animals such as horses, pigs, turkeys and ducks. However, domesticated and feral ducks are known to carry a large assortment of antigenic types, which have played a pivotal role in the ecological development of the influenza A virus (Reperant, et

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al., 2014). Thus far, this century has witnessed four major shifts: a) 1918 (Hsw1N1=H1N1); b) 1957 (H2N2); c) 1968 (H3N2); and d) a 1950 strain of H1N1 emerged and circulated in 1977.

Influenza viruses have the unique ability to initiate repeated yearly epidemics and even rapid spreading pandemics, affecting all age groups of the human population (Saglanmak et al., 2011). The severity of epidemics and pandemics is dependent on the antigenic variation of the virus, the degree of protective immunity within the population, as well as the comparative virulence of the viruses.

2.2.3   Molecular biology, structure and cell cycle of the influenza virus

All organisms containing a nucleus in their cells base their reproduction on a DNA (deoxyribonucleic acid) genome and very few organisms have a based replication in RNA (ribonucleic acid). Furthermore, RNA based viruses are capable of evolving a million times more rapidly as compared to their DNA based host. Because the error rate of RNA is so great, numerous strains and varieties of an RNA virus may exist and compete. The human influenza viruses are a type of single strand RNA based virus that belongs to the Orthomyxoviridae family. Influenza has three main strains, namely; A, B and C, each uniquely categorised by the antigenic properties of its inner, non-glycosylated mechanisms (Kallewaard, Corti, Collins, Neu, McAuliffe, Benjamin, Wachter-Rosati, Palmer-Hill, Yuan, Walker & Vorlaender, 2016). The A and B viruses are the ones with the ability to cause pandemics in people. The core of the viral particle comprises ribonucleoproteins, encompassed by a lipid envelope, containing two types of glycoproteins. The first protein is haemagglutinin spikes, which bind the virus to red blood cells in addition to other host cells, and the second is neuraminidase, an enzyme that splits terminal

sialic acid excesses from the host-membrane bound glycolipids and glycoproteins diameter (Baudon, Poon, Dao, Pham, Cowling, Peyre, Nguyen & Peiris, 2015).

Based on their main antigenic determinants, the influenza A virus can then be further divided into 18 H (H1-H18) and 11 N (N1-N11) subtypes with only 3 hemagglutinin subtypes and 2 neuraminidase subtypes having shown in humans and being responsible for annual epidemics.

Furthermore, neuraminidase enables the discharge of viral progeny from infected cells and is instrumental in the transmission of the virus from one cell to another. Even though antibodies against haemagglutinin and neuraminidase may lead to a reduction in the ability of the virus to reproduce within the host, it is only the haemagglutinin antibodies that are able to neutralise the infectivity of the virus particle.
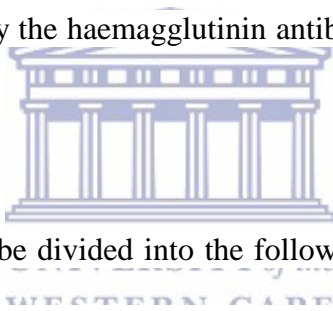
The influenza virus life cycle can be divided into the following stages: entry into the host cell; entry of viral ribonucleic proteins (vRNPs) into the nucleus; transcription and replication of the viral genome; export of the vRNPs from the nucleus; and assembly and budding at the host cell plasma membrane (Pflug, Guilligay, Reich & Cusack, 2014). The structure of the influenza virus and the structure in the life cycle of influenza virion facilitates in fighting this disease, thus causing a reduction in the transmissibility of the influenza disease.

2.2.4   Epidemic and Pandemic

An epidemic refers to an "outbreak of disease" that attacks and targets multiple individuals at about the same time and where transmission is achieved through one or several communities, whereas a pandemic refers to an epidemic that spreads throughout the world. Influenza

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epidemics are characterised by high rates of morbidity and mortality in the community (Collin, Radiguès & World Health Organization H1N1 Vaccine Task Force, 2009). According to the WHO (2016), approximately 3 to 5 million reported cases of influenza leading to 250 000 to 500 000 deaths have been recorded (World Health Organization, 2016). Archeo-epidemiological research provides some insight as to the characteristics of influenza pandemics in the past. Pandemics in influenza are usually identified by a shift in the virus subtype, noticeable swings leading to highest death rates in younger populations, followed by sequential pandemic waves, which have a higher transmissibility rate as compared to seasonal influenza. Lastly, geographical placement also plays a major role in the transmissibility rate of the virus (World Health Organization, 2016).
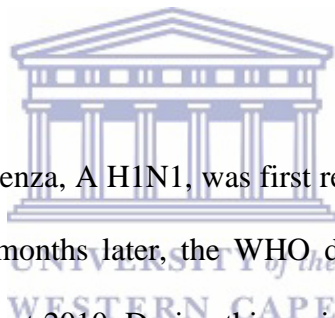
In April 2009, a new strain of influenza, A H1N1, was first recognised in Mexico and the United States and spread globally. Two months later, the WHO declared a pandemic alert Phase 6, which remained in place until August 2010. During this period, the WHO obtained data in order to describe risk patterns associated with the influenza A H1N1 virus infection and to develop a clinical picture (World Health Organization, 2016). Risk factors for severe disease following seasonal influenza infection have been well documented in many countries and include chronic medical conditions such as hematologic pulmonary, renal, cardiovascular, hepatic, neuromuscular and metabolic disorders.

2.2.5   Health seeking behaviour and preventative measures

According to Miller, Markewitz, Rolfs, Brown, Dascomb, Grissom, Friedrichs, Mayer, Hirshberg, Conklin and Paine (2010), the risk of contracting influenza is higher for community
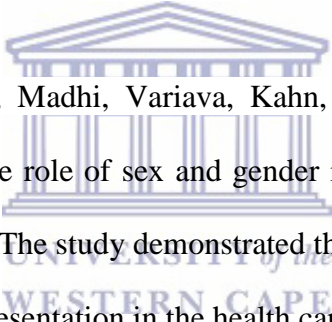
health workers (CHW) in a work-related environment in developing countries than those in developed countries. In a recent study conducted by Oshitani, Kamigaki and Suzuki, (2008), the rates of influenza related deaths were much higher in developing countries. Furthermore, the WHO (2008) estimated that between 3 and 5 million cases of severe influenza related illnesses were reported and that approximately 250 000 and 500 000 deaths were reported globally every year. Despite these alarming results, there is still a need for studies focusing on health seeking behaviour of CHW and preventative measures.

Biggerstaff, Cauchemez, Reed, Gambhir and Finelli, (2014) confirmed the existence of some data describing health care seeking behaviours among persons with influenza-like illness (ILI) or their observance of influenza antiviral treatment recommendations. The study included 75 088 adult and 15 649 child respondents and demonstrated that adults with pre-existing health conditions such as asthma, diabetes, heart disease, kidney disease and obesity were more likely to report ILI. The study also confirmed that 45% of adults and 57% of children sought healthcare for ILI and that only 34% of adults with self-reported diagnosis received treatment with antiviral medications. However, the majority of respondents did not seek any medical care and assistance immediately and thus had no access to influenza antiviral treatment (Biggerstaff et al., 2014).

Further studies have also investigated health seeking behaviour of people with regards to diseases. Van Cauteren, Vaux, de Valk, Le Strat, Vaillant and Lévy-Bruhl (2012) investigated the health seeking behaviour and hygiene measures during the A (H1N1) 2009 pandemic in France. Results indicated that 60% of respondents with influenza did not report their ILI to a physician. Thus, the influenza surveillance system of France was inaccurate as unreported cases

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were undocumented and undetected. Consequently, the actual impact of the virus and its pandemic status, mortality and morbidity rates were unknown (Van Cauteren et al., 2012).

Meng et al., (2016) conducted a similar study in Hong Kong with the aim to highlight and compare the health seeking behaviours of patients who had ILI between the two epidemics in Hong Kong. The study confirmed that the health seeking behaviour remained relatively similar with a slight increase in health care seeking behaviour and utilisation of healthcare services during these two periods (Meng et al., 2016). Previous studies have highlighted the role of pre-existing chronic conditions.

Murray, Cohen, Walaza, Groome, Madhi, Variava, Kahn, Dawood, Tempia, Tshangela and Venter (2015) have investigated the role of sex and gender in terms of exposure, susceptibility and immune response to influenza. The study demonstrated that women were more susceptible to influenza infection due to over representation in the health care profession (Murray et al., 2015).

A similar study was conducted in Lima, Peru, concerning the health seeking behaviours of patients, more specifically students with ILI (Tapia, Tinoco, Carcamo, Azziz-Baumgartner & Montgomery, 2014). The study demonstrated that an alarming majority of 86.3% of respondents resorted to non-medical attention and did not seek assistance from any medical professionals. The study also confirmed that respondents were more inclined to purchase over the counter (OTC) medication from pharmacies as opposed to using health care services (Tapia et al., 2014). In addition, results indicated that respondents between the ages of 18 and 49 were less likely to resort to medical attention when compared to other age groups. Thus, self-investigation and self-

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treatment and medication were reported as the most common forms of preventive health behaviours for students, as they preferred informal consultations in pharmacies (Tapia et al., 2014).

Van Kerkhove et al. (2011) conducted a study in a number of countries to collect data from April 2009 to January 2010 using surveillance programs of the Ministries of Health or National Public Health Institutes. The study was conducted in Argentina, Australia, Canada, Chile, China, France, Germany, Hong Kong, Japan, Madagascar, Mexico, the Netherlands, New Zealand, Singapore, South Africa, Spain, Thailand, the United States, and the United Kingdom. The study confirmed four categories of risk conditions, namely age, chronic medical illnesses, pregnancy (by trimester), and other conditions such as obesity. Reported cases were categorised according hospitalisation, admission to ICU and death. Findings from the study confirmed that risk factors for severe H1N1 infection were comparable to seasonal influenza, with minor differences (Van Kerkhove et al., 2011). The study reported that the presence of a chronic illness such as cardiac disease, chronic respiratory disease and diabetes increased the likelihood of fatality cases of H1N1. However, the study also demonstrated that 40% of hospitalised people who died from H1N1 infection did not have any identified pre-existing chronic illness and that obesity and pregnancy require further study, even though sufficient evidence exists to support vaccination and early intervention for pregnant women. In summary, the study aims to target high-risk groups for preventative measures and interventions such as early medical advice, immunisation and use of antiviral medications (Van Kerkhove et al., 2011).

In South Africa, Otwombe, Dietrich, Laher, Hornschuh, Nkala, Chimoyi, Kaida, Gray and Miller

(2015) conducted a study on the socio-demographic characteristics and health seeking behaviour of adolescents in Soweto. Findings from that study indicated that only 25% of respondents used health care services in the 6 months prior to the interview and that there was a need for general counselling services.

2.3   Influenza and South Africa

The following section will explore the impact of influenza and its effect in Africa and particularly South Africa. The impact of influenza in sub-Saharan Africa, and particularly in South Africa (SA) is considerable. According to Walaza and Cohen (2016), substantially elevated influenza-associated mortality rates have been reported in South Africa as compared to other countries in the region. Estimated figures of between 6 734 and 11 619 individuals have been reported to die of seasonal influenza-related illness in South Africa annually (Walaza & Cohen, 2016). The winter months in the country usually coincide with an increase in influenza infections, which usually occur within the first week of June (McAnerney, Cohen, Moyes, Besselaar, Buys, Schoub & Blumberg, 2012). However, it has been reported that the onset of influenza may start as early as the end of April and usually lasts for 12 weeks.

Approximately 14% of patients are reported to be hospitalised at government facilities with lower respiratory tract infection and a further 25% of patients with influenza-like illness (Walaza & Cohen, 2016).

2.4 Epidemiology

2.4.1 People affected

Healthy young adults and children are reported to be more affected by influenza with more than 50% aged between 10 and 29 and only 1% of reported cases among the elderly (Punpanich & Chotpitayasunondh, 2012). Khandaker, Dierig, Rashid, King, Heron and Booy (2011), further confirmed in a recent systematic review from 2009-2010, that persons with an average age of 18.1 years and a median age ranging from 12 to 44 years were more susceptible to infection. Besides age, socioeconomic factors such as unemployment also play a considerable role in the transmissibility of the virus. Qi, Qian, Bao, Guo, Cui, Tang, Ji, Huang, Cai, Lu and Xu (2013) confirmed that unemployed disadvantaged adults between the ages of 25 and 62 were at higher risk of contracting the virus as compared to employed persons and those who enjoy a higher socioeconomic status.
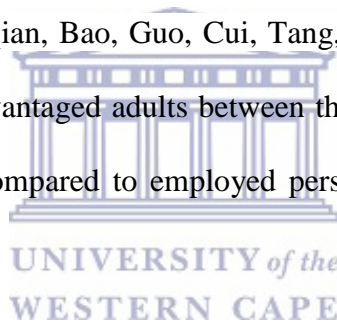
In South Africa, it was reported that children under the age of five were the most susceptible to influenza infection, followed by the elderly (65 years and above) (Murray et al., 2015). In addition, approximately 6 000 to 11 000 people die annually as a result of influenza related illnesses. The elderly account for more than half of that figure and about 30% is accounted for by People Living with HIV/AIDS (PLWHA). Thus, the highest hospitalisation rates are still found among the elderly, PLWHA and children under the age of five. In addition, tuberculosis (TB) patients and those suffering from chronic illnesses such as lung disease, heart disease and diabetes, as well as pregnant women, are also exposed to the risk of hospitalisation as a result of influenza. Cohen and Dolin (2013) report that the highest incidences of death associated with

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influenza cases were recorded for PLWHA between the ages of 20-44 years. Thus, PLWHA are at a higher risk of infection (Cohen & Dolin, 2013).

2.4.2   Health Care Workers (HCW)

Health care workers are especially vulnerable to influenza infection due to general exposure such as the home, public transport as well as the workplace. Infection risk is increased as a result of proximity to patients, exposure to visitors and co-workers (CDC, 2013). Thus, numerous studies have been conducted supporting the view that HCWs should receive influenza immunisation. A study by Albano, Matuozzo, Marinelli and Di Giuseppe (2014) highlights that the daily exposure of HCWs to infections is a major patient safety issue and provides data regarding the frequency and severity of influenza infection. In addition, many studies also support the use of influenza vaccines for all HCWs, which is believed to be based on strong legal and ethical platforms (Albano et al., 2014).
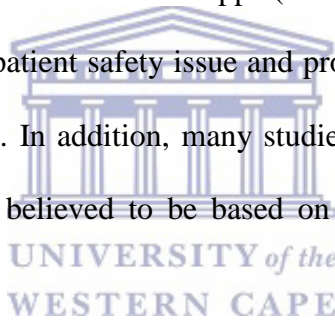
Immunisation and vaccination have been reported as the most effective available preventive measures for influenza and in this regard, HCWs play a particularly pivotal role. Jaiyeoba, Villers, Soper, Korte and Salgado (2014) conducted a study concerning the knowledge and perceptions of HCWs surrounding the influenza vaccine. The study establishes that nurses only took the vaccine to avoid a formal reprimand. Physicians also report that they were more inclined to take the vaccine due to patient care (Jaiyeoba et al., 2014). Fauci (2006) further explains that infections acquired at public health institutions such as clinics and hospitals present a significant threat to population health. Furthermore, nursing students are encouraged to promote preventative health behaviour models in order to offer better health care and prevention

strategies to patients. Unfortunately, it has also been documented that many HCWs have not consented to voluntary influenza immunisation programs despite the use of various educational and incentive programs in order to provide protection to patients under their care (Eaton, Mohr, McPhaul, Kaslow & Martinello, 2017). Eaton, Mohr, McPhaul, Kaslow and Martinello (2017) suggest that HCWs should receive an annual influenza immunisation, especially those who have direct patient contact, unless there are impediments such as a religious objection, medical contraindication or the existence of an informed reprimand signed by the HCW. The immunisation of HCWs will benefit the community at large, in addition to their families and employers.

2.4.3   Incubation period

Typically, the flu incubation period ranges from 24 hours to four days, with an average of two days, after exposure. Many common illnesses will only be contagious after symptoms are experienced, however influenza is contagious only a day before feeling sick (Nishiura & Inaba, 2011). This largely contributes to the rapid spread of the virus as people are often unaware that they are infected and tend to continue with daily activities, thus increasing exposure of others to infection. Once symptoms appear, the virus may be spread from between five to ten days in adults. Children can spread the virus for longer and people with generally lowered immune systems may spread the virus for weeks and even months (Nishiura & Inaba, 2011).

2.4.4   Symptoms of influenza

Influenza is an acute respiratory disease characterised in its full form by the "sudden onset of

high fever, cold, cough, headache, malaise, and inflammation of the upper respiratory tree and trachea" (Tanz, 2017). In most cases, it is not directly clinically associated with pneumonic involvement. Symptoms are acute and may persist for 7 to 10 days, but feelings of fatigue and weakness will remain for weeks (Nishiura & Inaba, 2011).

The flu may be mistaken for a common cold as they are both usually associated with a runny nose, sneezing and sore throat. The most common symptoms include a fever over 100.4 F (38 C), aching in the entire body, especially the limbs and back, headaches, chills and sweats, persistent dry cough, sore throat, nasal congestion, feeling fatigued and generally weak (Cameron, Roloff, Friesema, Brown, Jovanovic, Hauber & Baker, 2013). Basically, it is often described as being "hit by a bus". As opposed to the cold, which usually develops slowly, the flu emerges suddenly and is more severe, often leaving patients feeling worse than when affected by the common cold.
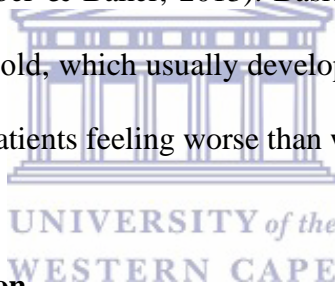
2.4.5 Transmission and Infection

Influenza viruses are replicated in the columnar epithelial cells of the respiratory tract (Bouvier & Lowen, 2010). The viruses are disseminated via respiratory secretions in small aerosol particles which are generated during coughing, sneezing and speaking (Bouvier & Lowen, 2010). Respiratory droplets are the main transmission mechanism together with touching areas that have been touched by infected persons. Crowded areas such as schools, hospitals and public places may be abundant with these droplets and in this manner the droplets are spread.

Flu viruses travel through the air in droplets and are spread by coughing, sneezing and speaking to an infected person (Cameron et al., 2013). Germs may also be inhaled directly from droplets

and picked up directly from objects that have been exposed to the virus, such as keyboards, cell phones, telephone handles and door knobs (Nishiura & Inaba, 2011).

Influenza may develop and cause further complications for persons who already have compromised immune systems, such as cancer patients and PLWHA. The risk of developing complications is thus higher due to the weakened immune system (Khandaker, Dierig, Rashid, King, Heron & Booy, 2011). However, influenza does not target any particular group within the population to the exclusion of others, although young children and older adults are at a greater risk of being infected (Kwok, Lam, Wong, Ip & Lam 2016). Persons living or working in health facilities such as HCWs are also more likely to be infected with influenza. Persons with chronic conditions such as heart disease, diabetes or asthma may also be susceptible to influenza complications, while pregnant women are more likely to develop influenza-related complications, particularly in the second and third trimesters as well as women who are two weeks postpartum (Khandaker, Dierig, Rashid, King, Heron & Booy, 2011). Complications may include but are not limited to pneumonia, bronchitis, asthma flare-ups, heart problems, ear infections. However, pneumonia is regarded as the most serious complication as was reported by Kwok, Lam, Wong, Ip & Lam (2016).

2.4.6   Myths about influenza

Influenza provides a good example of how myths will prevent the use of available medical care. It is thus necessary for people to differentiate fact from myth and take the necessary preventive steps to stay healthy. Even though there are numerous studies relating to the myths surrounding influenza, only the major and most popular ones will be mentioned in this section.

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2.4.6.1   Myths regarding transmission and infection

Numerous studies have been conducted concerning myths surrounding influenza (Tosh, Boyce & Poland, 2008; Talbot, Bradley, Cosgrove, Ruef, Siegel & Weber, 2005; Cameron, Roloff, Friesema, Brown, Jovanovic, Hauber & Baker, 2013). These were more prevalent during the pandemic of 2009, where media hype and all-round panic caused people to develop myths around influenza. A study was conducted on awareness, perception and myths regarding swine flu among educated members of the public in the Patiala district, India (Singh, Kaur & Singh, 2013). The study established that almost half of respondents believed that swine flu was spread by eating pork, a further 21% believed they were infected through food, while 15% believed it was the result of a mosquito bite. Most respondents were unaware of the actual mode of transmission and infection and only 36.5% regarded hand washing as a possible preventative measure. However, over 60% of respondents understood the importance of wearing a mask as a preventative measure (Singh, Kaur & Singh, 2013). There appear to be misconceptions concerning the spread of influenza. A prevalent belief is that the virus cannot be spread if a person is "feeling well". However, 30% of people carrying the virus might have no symptoms of the virus initially, but are still able to infect others (Booy, 2016).

2.4.6.2   Influenza and common cold myths

Many people believe that the flu is just a severe form of a cold and may be forgiven for doing so as the symptoms are quite similar. The flu and cold are both respiratory illnesses but may be caused by viruses which are very different (Eccles, 2006). They share similar symptoms, which is probably the basis for this misperception. However, symptoms for the flu are much more

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intense and severe and may lead to serious associated complications such as bacterial infections, pneumonia and hospitalisation (Eccles, 2006). The cold is usually characterised by similar symptoms but to a lesser degree and is usually differentiated by a stuffy and/or runny, sore throat, coughing and hoarseness (Eccles, 2006). This myth may have had major repercussions as thousands have lost their lives to flu due to incorrect self-diagnosis or confusion with the common cold. In the United States alone, 36 000 people were died and more than 200 000 were hospitalised each year because of the flu (Jong & Stevens 2011).

2.4.6.3 Influenza vaccine myths

Myths regarding the vaccine seem to be abundant. The biggest myth concerning influenza seems to be the idea that it can be transmitted directly via the vaccine (Tosh, Boyce & Poland, 2008). Even though influenza is responsible for many deaths in the United States, the coverage for the target vaccinations still remains below the public health target (Tosh, Boyce & Poland, 2008). One possible obstacle to greater immunisation rates is the false belief that it is possible to contract the flu from the flu vaccine. A study was conducted concerning the flu vaccine myth and results demonstrated that over 40% of respondents believed that the flu vaccine was the cause of the flu (Cameron et al., 2013). Essentially, flu vaccinations are inactive (dead) influenza virus cells in a purified solution. On injection into the body, they are attacked by the immune system (white blood cells) of the body (Li, Bu & Chen, 2014). Subsequently, the immune system will record the strain (genetic makeup) of the influenza virus, so as to facilitate faster and more efficient reaction time in the future, aiding in fighting off the virus. This may hinder the full-blown development of the virus in the body (Li, Bu & Chen, 2014).

The issue was addressed by the Centres for Disease Control and Prevention (CDC), which developed corrective information strategies (Fiore, Shay, Broder, Iskander, Uyeki, Mootrey, Bresee & Cox, 2008). This has, to an extent, significantly reduced belief in the myth, but has spurred on high levels of doubt regarding the side effects of the vaccine. Therefore, looking at rectifying the myths surrounding the flu vaccine may not necessarily be the best method to effectively promote immunisation (Nyhan & Reifler, 2015). To dispel this myth, it should be noted that the flu vaccine is developed from an "inactivated virus" that is unable to transmit infection (Nyhan & Reifler, 2015). The vaccine itself takes approximately two weeks to be fully active within the host's body. However, people who fall sick immediately after the vaccine often attribute their sickness to the vaccine. This is clearly a myth as the vaccine will only be effective after two weeks (CDC, 2009).
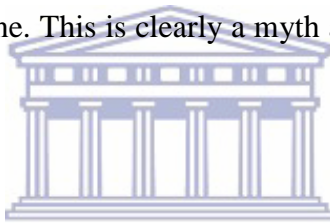
The second major myth is that the vaccination is only for chronically ill patients and that healthy people do not need it (Tosh, Boyce & Poland, 2008). However, healthy people are equally susceptible to infection and will therefore benefit from the flu vaccine. Currently, the CDC recommends guidelines suggesting annual vaccination for infants and children up to 19 years old, pregnant women and people over the age of 49 (Fiore, Shay, Broder, Iskander, Uyeki, Mootrey, Bresee & Cox, 2008). Secondly, the flu is highly transmissible and therefore healthy people especially should be vaccinated if they are in close proximity or exposed to people within the susceptible and vulnerable groups (CDC, 2009). Furthermore, it is for precisely this reason that HCWs are also encouraged to get the flu vaccination even if they are healthy so as to prevent further infection of patients at hospitals or clinics (Chance & Williamson, 2005).

Many believe that flu vaccines are not safe for children, pregnant women and those who have diabetes. Generally, flu vaccinations are recommended for people of all ages, but professional medical advice is always recommended and advised for people who have lowered immune systems such as PLWHA as well as oncology and chemotherapy patients, as it may result in possible complications (Louie, Acosta, Jamieson & Honein, 2010). Type 1 and Type 2 diabetic patients are especially advised to take flu vaccinations due to an already compromised immune system. As for pregnant women, they have been targeted by the WHO as a priority group for seasonal influenza vaccination due to high susceptibility to severe influenza from the second trimester to the early postpartum period (Neuzil, Reed, Mitchel, Simonsen & Griffin, 1998). HIV pregnant women are especially advised to take the vaccine due to HIV-related immunosuppression and are thus at a heightened risk for severe influenza (Schlaudecker, McNeal, Dodd, Ranz & Steinhoff, 2012).
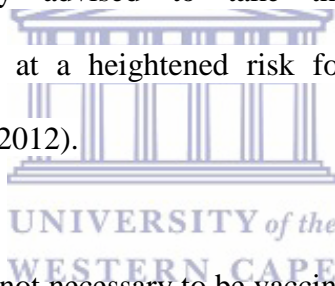
Many people also believe that it is not necessary to be vaccinated every year. This is incorrect as the influenza virus evolves, adapts and changes all the time (Louie, Acosta, Jamieson & Honein, 2010). New strains are always emerging and thus require new vaccines (Russell, Jones, Barr, Cox, Garten, Gregory, Gust, Hampson, Hay, Hurt & de Jong, 2008). Therefore, vaccination is recommended annually prior to the peak of the flu season.

In terms of how influenza in transmitted, it is a common belief that influenza is caused by exposure to cold weather or leaving the house with wet hair. This is because the influenza season usually coincides with the winter months, although they are not related at all (Russell et al., 2008).

It is also a common myth that the flu vaccination will provide complete protection from the flu. While it is true that the vaccination will lessen the severity of flu symptoms, there are other preventive measures to be considered for protection from the flu (Russell et al., 2008). These include avoiding contact with infected persons, practicing proper hand washing regimes frequently as well as considering antiviral medications if exposure occurred prior to vaccination (Van Kerkhove et al., 2011).

2.4.6.4   Dietary myths

Many myths also exist regarding the treatment of influenza in terms of diet, the most famous one being that one should "feed a cold, starve a fever" (Tosh, Boyce & Poland, 2008). The daily dietary intake of a person infected with influenza should be no different to that of a healthy person. Getting adequate nutrition is always recommended for a healthier lifestyle. Another myth suggests having chicken soup as a treatment for the flu and although this provides some degree of nutrition and fluids to the body, it does not contain anything specific for the treatment of flu.

2.4.6.5   Antibiotics as a Flu treatment

As is the case with any illness, it is vital to understand and treat the primary cause, be it viral or bacterial. As influenza is a virus, antibiotics will not kill cold or flu viruses. MacKenzie (2009) stated that many people believe that antibiotics may be used as a treatment for influenza, however, antibiotics are prescribed to fight against bacteria and are not suitable for viral infections such as influenza. Thus, the misuse of antibiotics may cause bacteria to become resistant and consequently increase the risk of developing infection. In this case, antibiotic treatment may be more harmful than beneficial to the patient (MacKenzie, 2009). It is therefore important to mention

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the role of antivirals. The CDC recognises that antivirals may reduce the degree of multiplication of the virus and is regarded as a "second line of defence against the flu" after receiving an annual flu vaccine (Willis & Wortley, 2007: 21). The CDC also further advocates that antivirals may assist in decreasing the severity of flu symptoms and reduce the prolonged period of the illness. However, it should not be regarded as a replacement for the vaccine (Willis & Wortley, 2007).

2.5   Treatment and Management of Influenza

Treatment and management of influenza include preventative and treatment measures such as the early identification of the virus, identification and treatment of high risk populations, administration of vaccines and antiviral drugs, and supportive care of patients (Demicheli, Jefferson, Al- Ansary, Ferroni, Rivetti & Di Pietrantonj, 2014). The WHO has recommended that the annual vaccination is the most effective way to prevent infection and severe outcomes caused by influenza viruses (Demicheli et al., 2014).
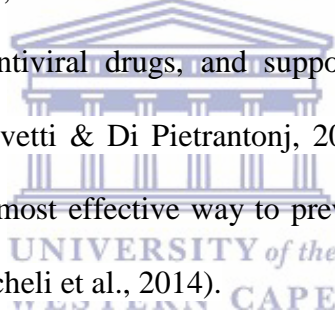
2.5.1   RT-PCR (reverse transcription-polymerase chain reaction)

Many countries have recently introduced Influenza Surveillance Programs including sub-Saharan Africa, Latin American and Asian countries (Nair, Brooks, Katz, Roca, Berkley, Madhi, Simmerman, Gordon, Sato, Howie & Krishnan, 2011). However, new technologies such as RT-PCR (reverse transcription-polymerase chain reaction) specified for virus detection are often unavailable in these countries (Wang, Hsu, Thong, Chao & Wang, 2017). Rapid testing, including the Directigen Flu A for example, has played a major role in the timely detection and management of the influenza virus. The reverse transcriptase PCR (RT-PCR) is also utilised as

an assay as it is an inexpensive, quick and sensitive method to effectively diagnose influenza and detect rimantadine and amantadine resistance (Wang, Hsu, Thong, Chao & Wang, 2017). Swine influenza viruses (SIV) have been identified by the Influenza Division of the Centres for Disease Control and Prevention (CDC) after being submitted as "unsubtypeable" influenza A virus samples (Shu, Wu, Emery, Villanueva, Johnson, Guthrie, Berman, Warnes, Barnes, Klimov & Lindstrom, 2011). Real-time reverse transcriptase PCR (rRT-PCR) procedures were employed for characterisation and detection of North American lineage (N. Am). Consequently, SIV were developed and implemented at the CDC for the rapid identification of specimens from suspected infections with SIV. In April 2009, these procedures were utilised for recognition of the 2009 A (H1N1) pandemic (pdm) influenza virus infection in humans (Shu, Wu, Emery, Villanueva, Johnson, Guthrie, Berman, Warnes, Barnes, Klimov & Lindstrom, 2011).
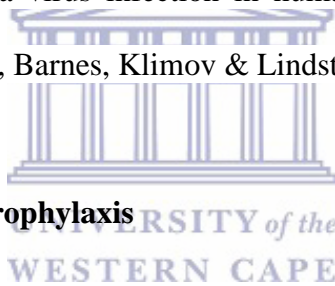
2.5.2   Vaccination and chemoprophylaxis

The most common methods employed for the prevention of disease include the use of vaccines and chemoprophylaxis. Chemoprophylaxis refers to the administration of medication for the purpose of preventing disease or infection (Havers, Campbell, Uyeki & Fry, 2017). It is important to note that the influenza vaccine should be taken at the onset of the flu season and its efficacy is largely dependent on correctly matching the vaccine strain with the viral strain (Saha, Chadha, Al Mamun, Rahman, Sturm-Ramirez, Chittaganpitch, Pattamadilok, Olsen, Sampurno, Setiawaty & Pangesti, 2014). Antiviral agents such as neuraminidase flu vaccines spur on the development of antibodies in the body approximately two weeks after vaccination (Havers, Campbell, Uyeki & Fry, 2017). After this period, the antibodies will provide protection against infection with the viruses that were in the vaccine.

Traditional flu vaccines, also known as "trivalent" vaccines, are developed to offer protection against influenza A (H1N1) virus, an influenza A (H3N2) virus and an influenza B virus (Eurosurveillance Editorial Team, 2017). "The most effective and safe way to prevent the disease is vaccination; the vaccine has been used for more than 60 years" (WHO, 2014). Vaccines developed to combat four viruses are called "quadrivalent" vaccines and have an additional B virus (Eurosurveillance Editorial Team, 2017). The CDC offers recommendations for the administration of influenza vaccines which include both the inactivated and recombinant influenza vaccines for 2017-2018. In addition, the nasal spray flu vaccine, also known as the live attenuated influenza vaccine (LAIV), has also been recommended (Saha, Chadha, Al Mamun, Rahman, Sturm-Ramirez, Chittaganpitch, Pattamadilok, Olsen, Sampurno, Setiawaty & Pangesti, 2014). The trivalent and quadrivalent vaccines have many forms, dependent on dosage and their target population, while monovalent vaccines are also available and have been produced against pandemic strains. However, particular vaccine strains will only be effective for a year due to the high mutation rate of the virus and the development of new strains (World Health Organization, 2014).

2.5.2.1 Standard-dose trivalent vaccine

Trivalent vaccines are either standard, high dose, recombinant or made with adjuvant (Eurosurveillance Editorial Team, 2017). The standard-dose trivalent vaccines (IIV3) are developed by using a virus grown in eggs (Dunkle, Izikson, Patriarca, Goldenthal, Muse, Callahan & Cox, 2017). There are different flu vaccines for different age groups and they are usually administered with a jet injector into the muscle of the arm. The suitable age group for the standard trivalent vaccine is between 18 and 64 years of age, whereas a high dose trivalent

vaccine is approved for persons of 64 years of age and older. A recombinant vaccine is a trivalent vaccine that is egg free and is developed based on recombinant DNA technology, which involves placing or inserting the DNA encoding into an antigen (Dunkle et al., 2017). A recombinant vaccine encourages an immune response in the mammalian and bacterial cells, thus expressing the antigen and then purifying it (Centres for Disease Control and Prevention, 2013). The recombinant vaccine is approved for pregnant women and for the age group of 18 years and older (Centres for Disease Control and Prevention, 2013). The trivalent vaccine developed with adjuvant will stimulate a more powerful immune response within the body of the patient and is approved for the older population such as 64 years and older (Centres for Disease Control and Prevention, 2013).

2.5.2.2   Quadrivalent flu vaccine

The quadrivalent flu vaccine may be administered to various age groups, including very young children such as babies of six months (Regan, Tracey, & Gibbs, 2015). The intradermal quadrivalent vaccine is not injected into the muscle but into the skin by a much smaller needle and is approved for the age group 18 to 64 years (Regan, Tracey, & Gibbs, 2015). The quadrivalent flu vaccine that has been developed and grown in a cell structure is approved for persons of four years of age and older and the recombinant quadrivalent flu vaccine is approved for pregnant women and people who are 18 years and older (Centres for Disease Control and Prevention, 2013).

2.5.3   Neuraminidase inhibitors (NAIs) and antiviral drugs

Neuraminidase inhibitors (NAIs) are commonly used as antiviral drugs and act by inhibiting the

viral neuraminidases of the influenza virus and hindering reproduction by budding from the host cell (Samson, Pizzorno, Abed & Boivin, 2013). Drugs belonging to this class include Laninamivir (Inavir), Zanamivir (Relenza), Oseltamivir (Tamiflu) and Peramivir (Samson, Pizzorno, Abed & Boivin, 2013). NAIs are effective against Influenza A and Influenza B. In terms of long lasting effect, Peramivir inhibits activation of neuraminidase much longer than Oseltamivir or Zanamivir, but because of the slow release of Laninamivir into the respiratory tract, it will result in longer-lasting anti-influenza virus activity as opposed to Peramivir (Jef Jefferson, Jones, Doshi, Del Mar, Hama, Thompson, Spencer, Onakpoya, Mahtani, Nunan & Howick, 2014). The efficacy of early treatment with NAIs for the reduction of deaths was reported in various countries, especially after the pandemic caused by H1N1 in 2009.

2.5.4   HCWs vaccination
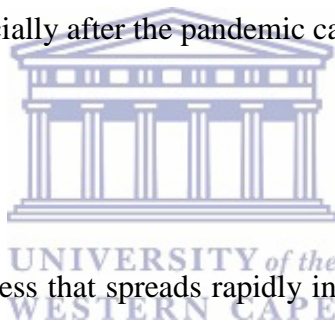
Seasonal influenza is a serious illness that spreads rapidly in populated and public settings. It is thus vital for anyone and more especially HCWs, who are constantly exposed to infection in their work places, to receive vaccination as a preventive measure against influenza transmission and illness (Albano et al., 2014). Therefore, the CDC has suggested that HCWs' vaccination rates be used to measure patient safety (CDC, 2010; National Health Interview Survey, 2009). However, despite the availability and convenience of influenza vaccines in addition to CDC and WHO recommendations, it appears that many HCWs do not take the annual flu vaccine (Albano et al., 2014). This is apparent in studies such as the National Health Interview Survey (2009), which reported HCWs' vaccination rates at only 53% in 2009. Furthermore, in Greece it was reported that the overall vaccination rate for HCWs was 65%, even though 44% of professional nurses reported the efficacy and usefulness of the vaccine (Gilca, Boulianne, Dubé, Sauvageau &

Ouakki, 2009). The Ministry of Health in Turkey has also recommended annual vaccination of HCWs, but only 35% received it (Hidiroglu, Ay, Topuzoglu, Kalafat & Karavus, 2010). The advantages of taking the vaccine for HCW are numerous and include protecting others, avoiding illness, vaccine cost and easy accessibility to and convenience of use (Erkin & Özsoy, 2012).

2.5.5 WHO and CDC recommendations

The WHO and CDC have submitted recommendations to lower the risk of influenza transmission. These include early vaccination of the entire family against current strains and the practice of proper coughing and sneezing etiquette such as covering the nose and mouth when sneezing. In addition, a person should maintain a distance from infected persons and generally avoid frequenting crowded areas. In terms of ventilation, the WHO has recommended frequent ventilation of rooms. It is also important to practice proper hand washing regimes with soap and water, especially after using public areas (World Health Organization, 2009). The WHO also recommended avoiding touching the hands, mouth and nose to prevent re-infection and that infected persons should avoid further contact with healthy persons for at least 24 hours (Centres for Disease Control and Prevention, 2009).

2.6 Conceptual framework

This study uses the Health Belief Model (HBM) as a conceptual framework. According to Erkin and Özsoy (2012) the HBM model attempts to describe and predict health behaviours by focusing on the attitudes and beliefs of individuals. It is a systematic method employed to explain preventive health behaviours based on belief patterns and highlights the link between

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health behaviours and the application of health services (Shahrabani, Benzion and Din, 2009).

2.6.1   Health Belief Model

According to Marentette (2011), the HBM has the ability to explain why some people take on protective health measures to protect themselves from illnesses and other people do not. According to the HBM, individuals make health related decisions and take action according to their perceived susceptibility to infection by a disease, whether being infected could lead to more serious harm, and whether taking some form of action could help decrease the severity or the likelihood of them being infected by the disease (Brown, 2010).

The HBM is based on six constructs that predict health behaviour: risk susceptibility, risk severity, benefits to action, barriers to action, self-efficacy, and cues to action (Champion & Skinner, 2008). This model was developed in 1966 by Rosenstock (Brown, 2010). Athota (2016), further states that the HBM can be used to explain health behaviour as well as predicting vaccination behaviour. Below is an illustration of the HBM.
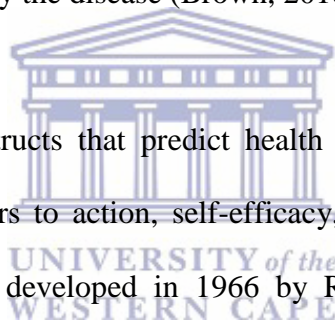
The Health Belief Model
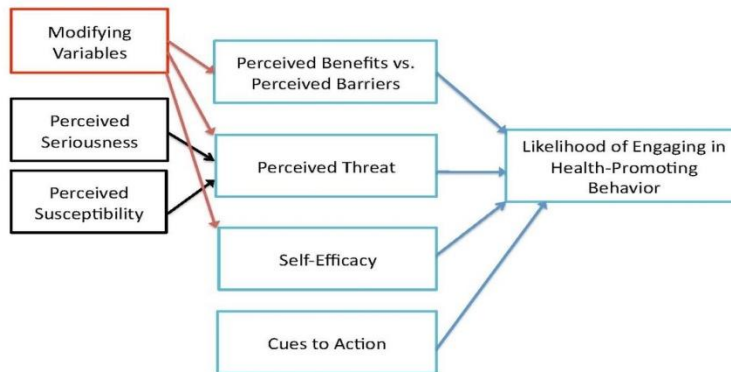
Figure 0.1: Health Belief Model

Thus, the HBM looks at the possible health related behaviours that could occur and the failure of individuals to practice preventative measures and guidelines in order to facilitate early detection of infection (Bird, 2015). The awareness of the perceived risk will encourage individuals to take steps to decrease that risk. Najimi and Golshiri (2013) indicate that individuals should first be exposed to the risk of infection to fully understand the severity thereof before seeking medical attention.

The HBM suggests that if people believe that the risk of exposure will carry serious consequences and that the adoption of certain behaviours will reduce that risk, then their behaviour will result in positive actions (perceived benefits) (Bish & Michie, 2010). In addition, the perception of limited negative attributes associated with a course of action (perceived barriers) will also encourage the application of health behaviours (Buglar, White & Robinson, 2010). Later scholars added self-efficacy, which refers to the belief that "one can successfully

complete the behaviour of interest despite considered barriers" (Buglar et al., 2010) and adopt a behaviour such as accepting the need for immunisation. The HBM model also suggests that certain cues such as internal or external factors will impact the final action of the person (Champion & Skinner, 2008). Internal cues range from personal experience of the symptoms of an illness to exposure to an educational campaign (Bish & Michie, 2010). However, cues to action are short-lived and have not been systematically evaluated (Champion & Skinner, 2008). Examples of cues include information sources and strategies that endorse the adoption or modification of a particular behaviour. The HBM has been used extensively in vaccination research for the identification of patient perceptions, beliefs and behaviours of disease and vaccination (Jones, Jensen, Scherr, Brown, Christy & Weaver, 2015).
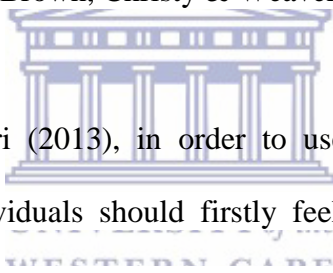
According to Najimi and Golshiri (2013), in order to use the HBM to adopt preventative measures towards influenza, individuals should firstly feel the risk, which is the perceived susceptibility, understand the seriousness of the risk, and then, through internal or external signs, believe in the applicability and usefulness of preventative behaviour. Individuals should also believe that the benefits of preventative behaviours would be less costly than the cost of curative treatment. They would also need to consider themselves capable of implementing the preventative behaviours or taking action towards the prevention of influenza.

This study will use the HBM as it conceptual framework because it has been used successfully in the past for similar studies. For example, Kamimura, Trinh, Weaver, Chernenko, Nourian, Assasnik, and Nguyen (2017) state that the HBM explains an individual's health seeking behaviours and can be used to examine vaccination self-efficacy and perceptions. In addition,

the HBM is also a promising tool in increasing uptake of influenza vaccination among health care workers (Cheung, Ho & Lam, 2017).

2.6.2   Global Influenza Surveillance Network

The Global Influenza Surveillance Network (GISN) is an organisation aimed at the development of knowledge and understanding on the issue of global influenza and the transmission of the virus (Demarcus, Soderlund & Voss, 2015). The critical role of the GISN is to monitor the antigenicity of the influenza viruses, to provide guidance regarding the criteria for strain selection for the annual influenza vaccine, as well as providing virus samples to facilitate vaccine development and production. The Global Influenza Surveillance and Response System (GISRS) is comprised of over 130 National Influenza Centres (NICs), whose primary goal is the collection and clinical testing of specimens. Collected specimens are then submitted to the WHO Collaborating Centres (WHO CC) and subjected to characterisation (World Health Organization, 2014). Due to the development of new strains and the pandemic of 2009, a need for knowledge development concerning the epidemiological information of influenza to complement the collected virological data of the GISRS has become critical. The World Health Assembly officially advocated this need in 2011 and adopted the Pandemic Influenza Preparedness Framework (World Health Organization, 2016). In addition, the pandemic of 2009 further exposed gaps in the capacity of the GISRS to successfully and accurately monitor the pandemic, as it was unable to evaluate and determine the severity of the pandemic or compare it against previous seasons, which is necessary for the detection of new developments in influenza strains (Ashshi, Azhar, Johargy, Asghar, Momenah, Turkestani, Alghamdi, Memish, Al-Ghamdi, Alawi & El-Kafrawy, 2014). This lack of data presented difficulties in understanding and generating

data on the global patterns and transmission of the disease. Therefore, the WHO advocated the standardisation of influenza data collection in order to enable policy and decision makers to better understand the "risk factors for severe disease, the variation of influenza severity from season to season and its relationship to virus types or subtypes, the burden of disease related to influenza" (World Health Organization, 2016).

2.7   Conclusion

This chapter has provided an overview of influenza and its epidemiological components. Myths regarding the spread of influenza, with a special focus on the vaccine related ones, have been provided. Because the focus of the study is the nursing students at a university in the Western Cape, the researcher has also highlighted previous studies relating to the views of HCWs concerning the flu vaccination and their susceptibility to infection. The chapter has also provided recommendations from the WHO and CDC concerning the prevention of the spread of influenza and has concluded with the conceptual framework for the study.

CHAPTER 3: METHODS AND MATERIALS

3.1   Introduction

The purpose of this study was to investigate the perceptions and attitudes of nursing students at a university in the Western Cape about influenza and their prevention and health seeking behaviour against influenza infection. Data for the study was collected from a group of nursing students enrolled at the university.

This chapter is a detailed presentation of the methodology and procedures utilised to collect data for the study. It provides a description of the research approach and design, the research setting, and the sampling method used. Furthermore, the chapter discusses the methods of data collection, statistical data analysis and ethical issues pertaining to the study.

3.2   Research approach and design

Creswell (2014) defines a research approach as "plans and procedures for the research and the research design as the procedures that will be used for inquiry". To address the aims and objectives of the research, a cross sectional survey was conducted which utilised a quantitative approach and a descriptive survey design. A cross sectional survey was chosen as the researcher wanted to gather data from the respondents from a single point of contact and not to contact respondents for data at different points in time.

3.2.1 Quantitative approach

A quantitative approach was taken in conducting this research study. This approach was used because quantitative research seeks to generate numerical data that can be analysed using statistics (Ingham-Broomfield, 2014), which was what the researcher sought to do.

The numerical data for this study was collected through self-administered questionnaires designed to obtain data on the perceptions and attitudes of the nursing students regarding influenza and their prevention and health seeking behaviour against influenza infection. The group of research respondents was made up of Foundation levels 1 and 2 and Bachelor 1, 2, 3 and 4 nursing students. The background characteristics collected from the study respondents enabled answering the research questions on the perceptions and attitudes of the nursing students regarding influenza and their prevention and health seeking behaviour against influenza infection according to their age, gender, student level, marital status, whether they have dependants or not, place of residence, religion and ethnicity.

3.2.2 Descriptive design

In its application of a quantitative research approach, this study made use of a descriptive survey design, which Ellis (2010) describes as statistics concerned with summaries of data generated during a study that can be presented in various ways such as graphs, charts and tables. The method of data collection chosen for the study was a written questionnaire because there is limited knowledge on the perceptions and attitudes of nursing students on their health behaviour regarding the influenza virus and it allowed the researcher to collect data from the sample with

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minimal expense.

Descriptive study designs are useful for describing the desired characteristics of the sample that is being studied. A descriptive study may also try to generalise the findings from a representative sample to a larger target population as in a cross-sectional survey. The common aspect between the descriptive study designs is that there is only one single sample without any comparison group (Omair, 2015).

The descriptive design was chosen in this study to describe the perceptions, attitudes of nursing students about influenza and their prevention and health seeking behaviour against influenza infection.
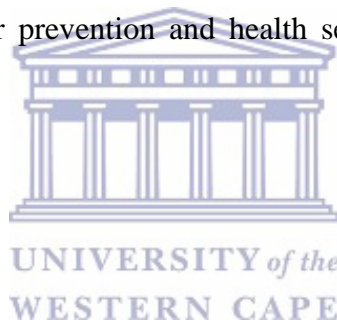
3.3 Study population

Gray, Grove and Sutherland (2017) define the population as all the elements that have the attributes that the researcher would like to include in the study.

Accessible population is defined as a fraction of the entire population to which the researcher has reasonable access (Dominick, 2015). In this research study, the accessible population included 1 053 undergraduate students in the School of Nursing at a university in the Western Cape. The population comprised of Foundation levels 1 and 2 and Bachelor levels 1, 2, 3 and 4 nursing students.

3.3.1   Sampling and sample size

A sample is defined as a subset of the population. It is taken from an accessible population for research purposes. Salaria (2012) defines sampling as a process in which a smaller number of individuals or objects are chosen and analysed in order to gain information about the population from which they were chosen. Levy and Lemeshow (2013) state that survey samples can be categorised into two broad classes according to how the sample was selected, namely probability sample or non-probability sample.

For this study, the sample size was calculated using proportional probability sampling. According to Levy and Lemeshow (2013), probability sampling is defined as a sampling technique through which every element in the population has a known non-zero chance of being included in the sample, meaning that unbiased estimates of population parameters that are linear functions of the observations such as population means, totals and proportions can be constructed from the sample data.

In this research, the proportional probability sampling was used to arrive at a sample size of 527, which is 50% of each level as presented in table 3.1

Table 0.1: Number of nursing students per year level and sample size of each level

Level of Study	Number of students	50% probability	Sample size
Foundation 1 (F1)	66	0.5	33
Foundation 2 (F2)	46	0.5	23
Bachelor Nursing 1 (BN1)	227	0.5	114
Bachelor Nursing 2 (BN2)	239	0.5	120
Bachelor Nursing 3 (BN3)	228	0.5	114
Bachelor Nursing 4 (BN4)	247	0.5	124
Total	1053	0.5	528
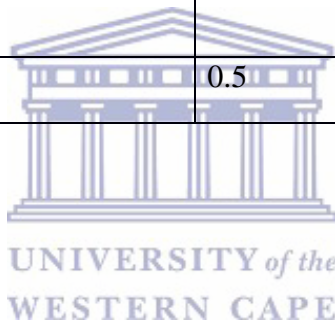
3.4 Data collection

3.4.1 Data collection instrument

The questionnaire was developed using the Health Belief Model (HBM) and existing literature around perceptions and attitudes of individuals and their health seeking behaviour regarding influenza. In designing the data collection instrument, the HBM was used as a guide because of its consistency with the aims and objectives of this study.

For this study, the researcher developed the questionnaire in sections (APPENDIX 1), each of which were directly aligned to selected HBM constructs. This allowed the researcher to record nursing students' attitudes, perceptions and health seeking behaviour of influenza against the particular HBM constructs which, according to Marentette (2011), affect whether or not people

decide to take part in preventative actions. These include:

(a) their susceptibility to the illness;

(b) the severity of the illness;

(c) benefits of the preventive health behaviour and

(d) barriers associated with the preventive health behaviour.

In designing the data collection instrument, each question was aimed at capturing the respondents' perceptions, attitudes and health seeking behaviour on the very same constructs listed above, keeping the data collection highly aligned to the HBM. There were clear instructions at the top of the questionnaire asking the respondent to tick the appropriate response for each question.
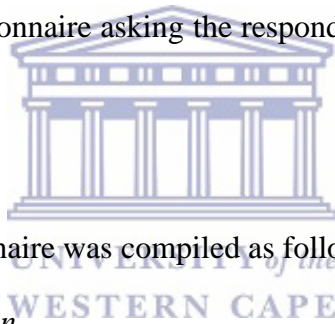
The structured self-report questionnaire was compiled as follows:

Section A: Biographical information.

This section of the questionnaire was divided into 9 subsections which captured the respondents' demographic and biographical data: Age, Gender, Marital Status, Number of dependants, Level of study, Location, Medical aid, Ethnicity and Religion.

Here the respondents had to indicate on the questionnaire by ticking an appropriate response for each variable. Table 3.2 below is an excerpt from the questionnaire.

Table 0.2: A portion of the questionnaire from Section A

1. Age	
15 to 20 years	
21 to 25 years	
26 to 30 years	
Over 30 years	

The rest of this section had similar questions asking respondents to tick an appropriate response for the remaining 8 subsections.
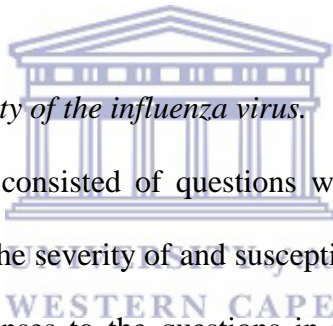
Section B: Severity and susceptibility of the influenza virus.

This section of the questionnaire consisted of questions which were designed to capture the perceptions of the respondents on the severity of and susceptibility to influenza. The respondents were asked to indicate their responses to the questions in this section according to a 4-point Likert scale as indicated by the example below in Table 3.3.

Table 0.3: An example of a question on the 4-point Likert scale from Section B

Questions	1	2	3	4
10. Contact with the multiple people each day increases my chances of contracting the flu				

The following scale was used: (1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree. The responses indicated the respondents' level of agreement with the statements in this section of the questionnaire. This section also consisted of "true or false" questions in which the

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respondents had to tick the appropriate answer to indicate whether they believed the statement to be true or false.

Table 0.4: An example of a True or False question taken from Section B

22 The following people are at high risk for developing flu related complications. Tick which ever applies.	YES	NO
Children younger than five, but especially children younger than 2 years.		

Section C: Benefits of the influenza vaccination.

This section captures the respondents' perception about the benefits of the influenza vaccine on a 4-point Likert scale. Their responses would be indicative of the level to which they agree with the statements. Table 3.5 depicts an example of the 4-point Likert scale descriptors and a question from Section C.
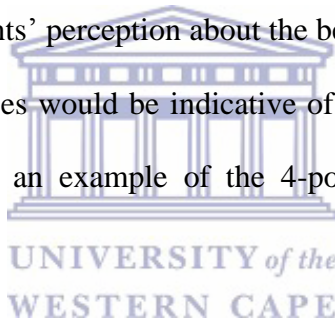
Table 0.5: An example of a question on the 4 -point Likert scale from Section C

Questions	1	2	3	4
Taking a flu vaccine will prevent me from contracting the flu virus				

The following scale was used: (1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree.

The study respondents' responses to this part of the questionnaire gave an indication of the extent of their agreement with the statements.

Section D: Barriers and Cues to Action/Health seeking behaviour.

This section of the questionnaire sought to gather data pertaining to the perceptions of the

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research respondents' barriers and health seeking behaviours to the influenza virus.

The first part of this section consisted of closed questions such as the one in the table below.

Table 0.6: An example of a question from the first part of Section D

I took the flu vaccine after:	YES	NO
I read about the possible complication of contracting the flu		

The second part of this section, which is about the barriers to the influenza vaccination, was made up of 4-point Likert scale questions set up with the scale descriptors matching the ones in the previous sections. The following scale was used: (1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree. Table 3.7 shows an example question from this section.
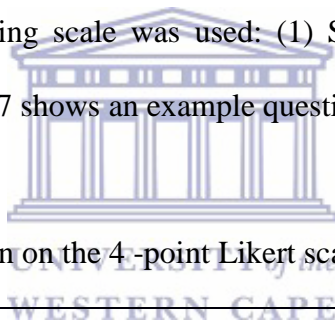
Table 0.7: An example of a question on the 4 -point Likert scale from part two of Section D

Questions	1	2	3	4
Taking a flu vaccine is not convenient for me.				

The responses obtained here gave the researcher an indication of the extent of their agreement with the statements.

The final part of Section D sought data on the respondents' perceptions about their health seeking behaviour toward the influenza. The respondents had to select the option which best described the last time they had contracted influenza from a list of timeframes as shown by Table 3.8 below.

Table 0.8: A question taken from the last portion of Section D

When did you last contract the influenza (Flu)?	
0 – 6 months	
7 – 11 months	
12 – 24months	
More than 2 years	

3.5 Validity

Validity is defined as how well a measuring tool measures what it is intended to measure (Heale & Twycross, 2015). When an instrument is truly valid, it accurately reflects the concept which it is supposed to measure (Dominick, 2015).
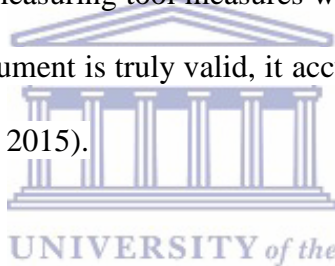
Face validity is an important aspect of the usefulness of the instrument (Dominick, 2015). It checks whether the instrument is able to measure the concepts. Face validity refers to the degree to which the instrument is clear and unambiguous. The supervisor was involved in determining face validity of the instrument by looking at the appearance of the items in the questionnaire.

Content validity is also an important aspect of the validation of a data collection tool. It can be defined as the extent to which the elements of the tool are representative of the constructs (Delgado-Rico, Carrctero-Dios & Ruch, 2012). Table 3.9 below shows the questions in the questionnaire and how they are aligned to the research objectives. This demonstrates the content validity of the questionnaire.

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Table 0.9: Alignment of questionnaire to study objectives

Objectives	Questions	
To determine students' perceptions and attitudes about the severity, susceptibility and risk of influenza.	10-21	22-25
To assess nursing students' perceptions about perceived benefits and barriers to the influenza vaccination.	26-31	38-44
To identify participants' cues to action and determine the relationship between demographic and attitudinal variables and participants' intention to receive the influenza vaccination.	32-37	45
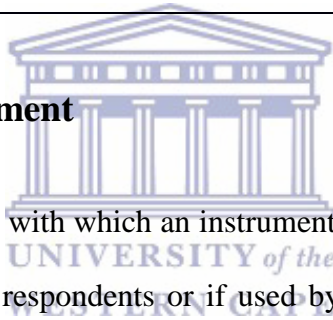
3.6 Reliability of the instrument

Reliability refers to the consistency with which an instrument provides similar results if it is used repeatedly over time on the same respondents or if used by two or more researchers (Babbie, 2010; Polit & Beck, 2012).

3.6.1 Pre-testing the instrument

A pre-test of a research instrument is a procedure for testing and validating an instrument. Gray, Grove and Sutherland (2017) suggest that the pre-test of a research instrument is a smaller version of the survey, administered to a small group of respondents before the final survey is carried out. A pre-test of the research instrument used in this study was conducted to test the feasibility of the research instrument and to fine-tune the research instrument if needed. The questionnaire was pre-tested on a group of 31 nursing students at the university in the Western

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Cape, after which a Cronbach Alpha test was done, which yielded a Cronbach Alpha of 0.8, indicating that the research instrument was reliable. A total of 3 items were removed from the test for the "perceptions about susceptibility to and severity of the influenza" in order to boost the coefficient alpha to 0.687

3.7   Data collection process

Prior to any data for the study being gathered, permission to conduct the study was sought from the Registrar of the university and the Director of the nursing school.

A pre-test of the questionnaire was randomly done on 31 nursing students and the process took three days to complete. After the pre-test of the questionnaire was completed and corrections were made to the questionnaire, which included rearranging the location, marital status and "yes" or "no" questions to improve clarity, appointments were made with the lecturers of each level of the programme to request access to the students before or after the class sessions on the university campus.

After a date and time had been agreed on with the lecturers, the researcher went to the various classes to conduct a briefing session with the students to explain about the research and to give them background information pertaining to the study. During the briefing sessions, the researcher answered questions that the students had about the study. The data was collected from the students after class in the classroom, laboratory or hospital. A date and time for data collection was established. On the day of data collection, the researcher obtained a written informed consent (APPENDIX 4 and 5) from the students before the questionnaires were distributed to

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consenting students. The researcher answered any questions from the students about the questionnaire. The completed questionnaires were collected by the researcher directly after they had been completed.

The data collection took place towards the end of the study year and this had an effect on the rate at which data could be collected as most of the students were not attending the class sessions at the university regularly. This resulted in the researcher not being able to collect enough data due to a shortage of respondents. The researcher had to find other ways to get more students to participate in the research and therefore resorted to recruiting students as they were arriving at the school of nursing or relaxing on campus. Some of the students were recruited to take part in the study as they came out from their practical exams from the Skills Laboratory.
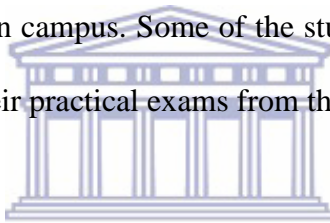
The researcher gave 10 copies of the questionnaire to the Skills Laboratory lecturer to pass onto the students when they came in for their training in the hospital and another 40 copies of the questionnaire were given to two Master's nursing students who resided on campus to have them answered by nursing students that lived on campus.

A questionnaire was chosen as the research instrument because it provided the researcher with an inexpensive means of data collection as well as the fact that it can provide consistent responses and unbiased data analysis (Rowley, 2014). Also, since the names of the respondents are not recorded anywhere, this tool provides anonymity for the research respondents.

The data collection took a month and three days to complete (between November and December

2017). During this period, the researcher spent most of the day on campus, usually from around 9am to 4pm, recruiting study respondents and having them fill out the research questionnaire. The questionnaire took the students approximately five to seven minutes to complete. After completion of questionnaires, the researcher collected them and kept them in a locked drawer, to which only she had access, for safekeeping.

3.8   Data analysis and interpretation

Data analysis is a process in which the raw data is organised and ordered in a manner whereby it is possible to extract useful information (Dominick, 2015).

Of the 10 questionnaires which were given to the Skills Laboratory lecturer, all were completed and returned to the researcher. However, only 38 completed questionnaires of the 40 that were given to the two Master's students for completion by respondents that resided on campus were returned. To make up for the two questionnaires that were not completed by respondents residing on campus, the researcher interviewed two more respondents from the nursing school as the researcher was still collecting data from the nursing students. The response rate to the study was therefore 100% as the researcher managed to collect data from the entire sample.

The researcher coded each of the questions in every questionnaire and the data was recorded in excel software, which allowed the researcher to keep track of the numerical values of the variables being studied. The data collected in this study was analysed using SPSS Version 24 software program. The data was presented in tables and graphs and with the help of a statistician. Descriptive univariate and bivariate statistical analysis were used in analysing the data. The

descriptive statistics provided the researcher with the ability to collate the data collected in a structured manner. This allowed the researcher to be able to organise the data in a meaningful and insightful way (Dominick, 2015), allowing the subject to be viewed from a variety of angles.

Univariate analysis, which involves the analysis of a single variable and its detailed examination, was used together with bivariate analysis, which involves the analysis of two variables and analysing the associations between them and understanding how those associations work. To find out whether there were any significant differences between perceptions, attitudes and health seeking behaviours and socio-demographics of respondents, two bivariate analyses (t-test and one-way ANOVA) were undertaken based on gender, age, ethnicity and level of education. To do this, composite scores were generated for the four indicators used in understanding the attitudes, perceptions and behaviours of respondents regarding influenza: perception about susceptibility to and severity of the influenza virus; benefits of influenza vaccination; cues to action and respondents' perception of barriers towards uptake of influenza vaccination. In analysing the results of the study, t-tests were done to explore gender differences in perception of attitudes, beliefs and behaviours towards the influenza virus alongside the respective constructs. A one-way ANOVA between groups analysis of variance was conducted to explore the variability of age on the perception of attitudes and behaviours towards the influenza virus alongside the respective constructs, as well as a one-way ANOVA of educational differences in perception of attitudes and behaviours. A one-way ANOVA between groups analysis of variance was conducted to explore the variability of ethnicity on the perception of attitudes and behaviours towards the influenza virus using the four indicators.

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3.8.1 Missing data in the results

The issue of missing data is an important area of concern in data analysis. Missing data in a survey that has not been addressed may introduce ambiguity in the results of the study. While a number of approaches have emerged on how missing data can be addressed, normally the choice of approach will depend on the circumstance under which missing data may arise. Regarding this research, missing data was observed (missing at random). However, given that the degree of "missingness" is small, in that the variable with highest degree of "missingness" is less than 5%, only the observed and not the complete data was used in the inferential statistics. This was done because it was unlikely to alter the final results of the study.

3.9 Ethics statement

Ethics approval to conduct this research was obtained from Humanities and Social Sciences Research Ethics Committee (HSSREC). Reference No. HS17/9/7. Permission to conduct the study was sought from and granted by the Registrar of the university and the Director of the nursing school (APPENDIX 3). All respondents were asked to provide written consent after they had been orientated to the study. Voluntary participation was vital, and respondents had the opportunity to withdraw from the study at any time without any penalty. To ensure anonymity, the names of the respondents were omitted on the questionnaire and their identity was protected during data analysis by using codes. The results of this study were therefore captured without mentioning the names of the respondents. To ensure confidentiality, completed questionnaires were kept secure in a locked drawer to which only the researcher had access. This study is for academic purposes - for the degree of Masters in Nursing.

3.10 Limitation of study

South Africa has nine provinces with many universities in each province. This research was only conducted at one university in the Western Cape. While universities consist of many different departments, this study focused only on undergraduate nursing students at this university.

The fact that the study only focuses on the nursing school of this particular university and not on other departments at other universities in other provinces around the country affects generalisability. This means that the researcher will not be able to generalise the results to students in departments at other universities around the country.

Universities in South Africa have students with different socio-economic backgrounds and as such the use of one university will not be representative of the whole country.
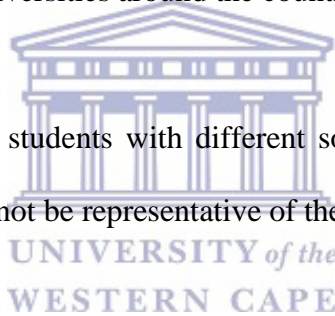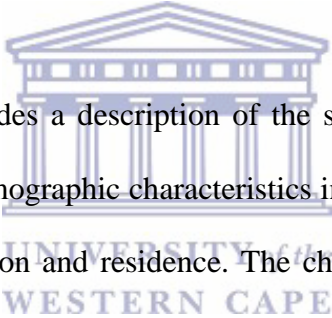
3.11 Conclusion

This chapter has covered the details pertaining to this study's research approach and design. This study took a quantitative approach that used a descriptive survey design. The research method, which included the population and sampling, data collection instrument, data collection process and data analysis, are described in the chapter along with the measures taken by the researcher to ensure the validity and reliability of the data. The next chapter will present the results of this research study.

CHAPTER 4: PRESENTATION OF RESULTS

4.1 Introduction

This chapter presents the results of the statistical analysis that attempted to answer the three objectives of the study: (1) to determine and assess nursing students' perceptions and attitudes about the severity, susceptibility, and risk of influenza; (2) to assess nursing students' perceived benefits and barriers to the influenza vaccination and (3) to identify respondents' cues to action. The results further presents the relationship between demographic and attitudinal variables and respondents' intention to receive the influenza vaccination.

The first part of the chapter provides a description of the socio-demographic characteristic of study respondents. These socio-demographic characteristics include age, sex, study level, marital status, dependents, ethnicity, religion and residence. The chapter further presents a descriptive analysis of the susceptibility to and severity of the influenza virus based on respondents' perceptions and attitudes. Additionally, the chapter presents participants' perception of the benefits of influenza vaccination as well as a description of participants' barriers and cues to action/health seeking behaviour.

The chapter concludes with an analysis of the differences between attitudes, perceptions and behaviours based on gender, age, ethnicity and level of education among respondents. This was done by computing bivariate analyses including t-tests as well as one-way analysis of variance (one-way ANOVA).

4.2 Socio-demographic characteristics of study respondents

Table 4.1 presents information on the socio-demographics of the survey respondents. Of the 530 nursing students that were interviewed, the majority were females, about 77%. Also, approximately 85% of the study respondents were between the ages of 15 and 25 years of age. About 9% were between the ages of 26 and 30 years of age, while only 6% were over 30 years of age.

Table 0.1: Socio-demographic characteristics of survey respondents

Variables	Frequency	Percentage
Age		
15 to 20 years	168	31.7
21 to 25 years	283	53.4
26 to 30 years	46	8.7
Over 30 years	33	6.2
Sex		
Male	120	22.6
Female	410	77.4
Student level		
Foundations 1	33	6.2
Foundations 2	24	4.5
B Nursing 1	114	21.5
B Nursing 2	120	22.7
B Nursing 3	115	21.7
B Nursing 4	124	23.4
Marital Status		
Single	485	91.5
Married (divorced, widowed, co-habitation)	45	8.5

Dependents

0	381	71.9
1	88	16.6
2	25	4.7
3	16	3.0
More than 3	18	3.4
Missing	2	0.4

Ethnicity

Black	349	65.8
White	31	5.9
Coloured	144	27.2
Indian	5	0.9
Missing	1	0.2

Religion

Christian	483	91.1
Muslim	27	5.1
Hindu	0	0
Other	20	3.8

Residence

On campus	94	17.7
Off campus	436	82.3

Source: Field survey, 2017

It is can also be observed from Table 4.1 that regarding students' level of study, the proportion of students enrolled in B Nursing 1,2,3 and 4 did not differ significantly with 21.5% for B Nursing 1 and 22.7% for B Nursing 2, while 21.7% of the students were in B Nursing 3 and 23.4% came from B Nursing 4. The proportion of respondents from the foundation levels was small, with 6.2% from Foundation level 1 and 4.5% coming from Foundation level 2. The study further found that the overwhelming majority of respondents are single (91.5%). Only 8.5% were either

married, divorced, widowed or co-habiting. The study results also showed that 71.9% of respondents had no dependents, 16.6% had 1 dependent and 4.7% indicated that they had 2 dependents, while a further 6.4% had three or more dependents. There was also a small portion of respondents (0.4%) that chose not to indicate whether or not they had any dependents.

On ethnicity, approximately 66% of respondents were Black, followed by Coloured at around 27%. The White and Indian respondents comprised the smallest ethnic groups, 5.9% and 0.9% respectively, while one respondent did not give any indication of their ethnicity (0.2%). Concerning religion, the majority of the respondents indicated that they were Christians (91.1%), while Muslims (5.1%) and other religions (3.8%) were in the minority. However, no score was found for Hindu (0%). Table 4.1 also shows that the majority of the respondents lived off campus (82%) compared to 18% who indicated that they lived on campus.
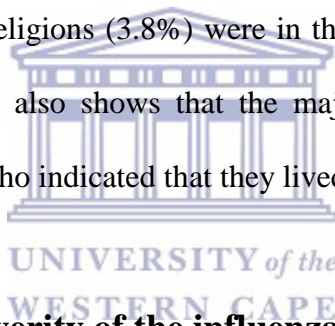
4.3   Susceptibility to and severity of the influenza virus

Table 4.2 presents respondents' perceptions of susceptibility to and severity of the influenza virus. From the table, it can be seen that the majority of the respondents (79.2%) either agreed or strongly agreed that their contact with multiple people each day increases their chances of contracting the flu. A total of 19.5% of the respondents either disagreed or strongly disagreed and a small percentage (1.3%) did not respond to this question. Respondents had a divided perception about whether people with cardiac disease are more likely to contract influenza, with 53.8% disagreeing or strongly disagreeing and 44.5% agreeing or strongly agreeing. A few (1.7%) respondents did not response to this question.

In asking respondents whether people with chronic disease such as diabetes mellitus or asthma are more likely to contract influenza, some 60.6% responded in the affirmative by agreeing or strongly agreeing and 39.4% either disagreed or strongly disagreed with that perception. Interestingly, an overwhelming majority of respondents (85.2%) agreed or strongly agreed that people with immunosuppression are at high risk of influenza complications and 4 respondents (0.8%) did not respond to this question, while 14% said that they either disagreed or strongly disagreed.

Table 0.2: Respondents' perceptions of susceptibility to and severity of the influenza virus

Questions	Strongly Disagree	Disagree	Agree	Strongly Agree	Missing
Contact with the multiple people each day increases my chances of contracting the flu	38 (7.2%)	65 (12.3%)	229 (43.2%)	191 (36.0%)	7 (1.3%)
Contract influenza has an impact on my job	30 (5.7%)	81 (15.3%)	241 (45.4%)	165 (31.1%)	13 (2.5%)
Flu is just like having a heavy cold	49 (9.3%)	116 (21.9%)	253 (47.7%)	95 (17.9%)	17 (3.2%)
Flu can be treated with antibiotics	85 (16.0%)	99 (18.7%)	183 (34.5%)	143 (27.0%)	20 (3.8%)
Once you have had the flu vaccine, you're protected for life	243 (45.8%)	177 (33.4%)	71 (13.4%)	29 (5.5%)	10 (1.9%)
Vaccination against influenza is a waste of time and money	238 (44.9%)	195 (36.8%)	62 (11.7%)	26 (4.9%)	9 (1.7%)
People with cardiac disease are more likely to contracting influenza	89 (16.8%)	196 (37.0%)	199 (37.5%)	37 (7.0%)	9 (1.7%)

People with chronic disease such as diabetes mellitus or asthma are more likely to contracting influenza	50 (9.4%)	159 (30.0%)	237 (44.7%)	84 (15.9%)	-
People with Immunosuppression are at high risk of influenza complications	24 (4.6%)	50 (9.4%)	226 (42.6%)	226 (42.6%)	4 (0.8%)
Difficulty breathing or shortness of breath due to contracting influenza needs to get medical help immediately	18 (3.4%)	51 (9.6%)	200 (37.7%)	261 (49.3%)	-
Runny or stuffy nose is a symptom of contracting influenza	18 (3.4%)	84 (15.8%)	268 (50.6%)	157 (29.6%)	3 (0.6%)
Contracting influenza may lead to other serious health problems	21 (4.0%)	86 (16.2%)	262 (49.4%)	158 (29.8%)	3 (0.6%)

Source: Field survey, 2017
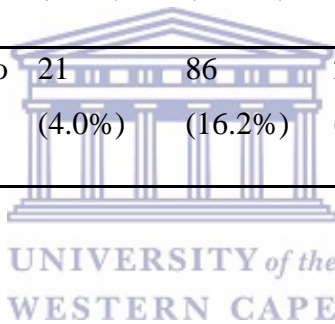
Table 4.2 also reveals that more than half of the survey respondents (65.6%) either agreed or strongly agreed that flu is just like having a heavy cold while 31.2% disagreed or strongly disagreed with the statement and 3.2% of the respondents chose not to answer the question. Also, 76.5% of respondents agreed or strongly agreed that contracting influenza has an impact on their job, whereas 21% were of the opposite view and 2.5% of the respondents chose not to answer the question. In addition, 61.5% of respondents either agreed or strongly agreed that flu can be treated with antibiotics, whereas 34.7% disagreed or strongly disagreed and 3.8% (20 respondents) did not provide a response, resulting in some missing data.

Approximately 79.2% of respondents disagreed or strongly disagreed that once you have had the

flu vaccine, you are protected for life, while 18.9% either agreed or strongly agreed and 1.9% of the respondents did not give a response to this question. Also, 81.7% of respondents disagreed or strongly disagreed that vaccination against influenza is a waste of time and money, whereas 16.6% agreed or strongly agreed, and there was a small percentage of missing data (1.7%) due to a few respondents leaving the question unanswered.

As part of the survey questions, respondents' perceptions were elicited on whether difficulty in breathing or shortness of breath due to contracting influenza requires immediate medical help. In this regard, 87% of the respondents agreed or strongly agreed, while 13% felt the opposite. Also, the majority of respondents (80.2%) agreed or strongly agreed that a runny or stuffy nose is a symptom of contracting influenza, whereas 19.2% disagreed or strongly disagreed with that statement and, due to three of the respondents not providing an answer, there was some missing data (0.6%).
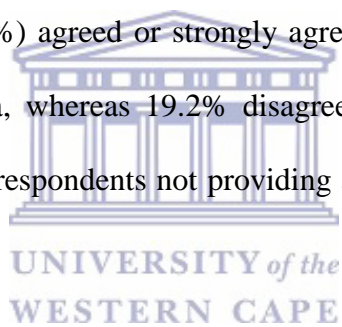
The majority of respondents (79.2%) agreed or strongly agreed that contracting influenza may lead to other serious health problems, while 20.2% disagreed or strongly disagreed and three respondents did not give a response to this question (0.6%).

Figure 4.1 presents respondents' perceptions about which groups of people are most susceptible to the influenza virus. Results indicated that 60% of respondents were of the opinion that young adults 19 through 24 years of age who often live, work and study in close proximity are at high risk for developing flu-related complications. Also, 74% of respondents indicated that pregnant women and people who have medical conditions such as asthma and heart disease are at high

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risk for developing flu related complications.
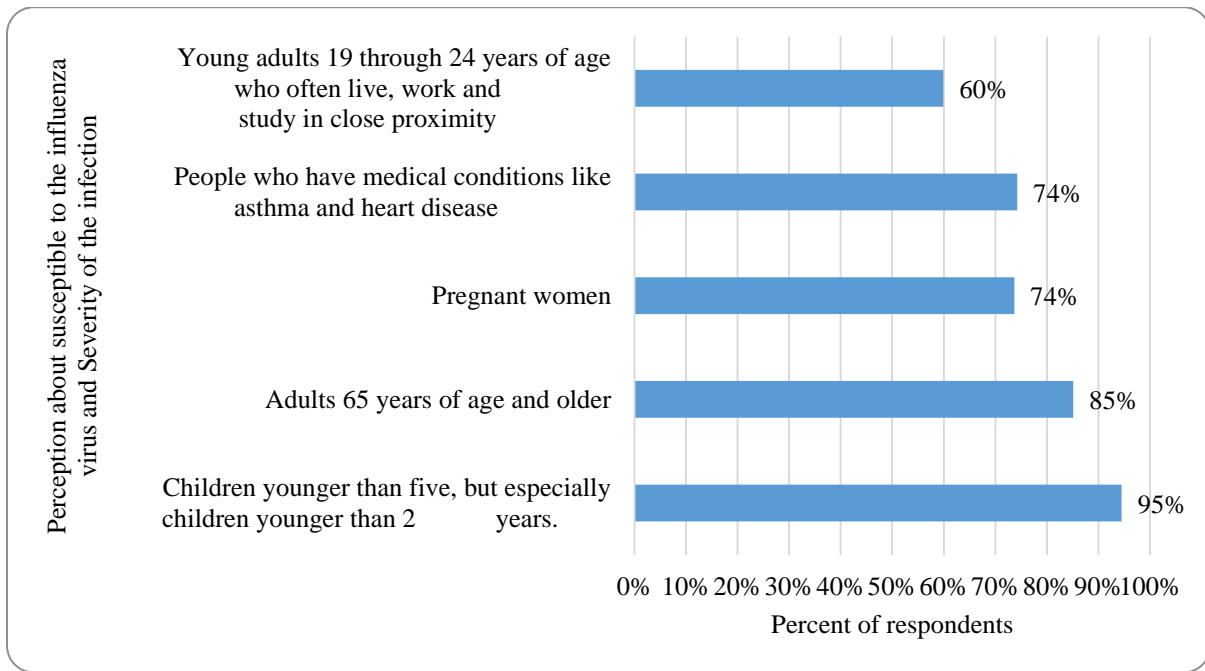
Figure 0.1: Perception about susceptible to the influenza virus and Severity of the infection
Source: Field survey, 2017
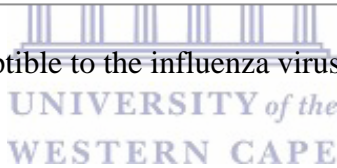
Figure 4.1 shows that 85% of respondents indicated that adults 65 years of age and older are at high risk for developing flu related complications. Additionally, 95% of respondents indicated that children younger than five, but especially children younger than two years of age are at high risk for developing flu related complications. What this implies is that nearly all respondents perceive children under five years of age as the most vulnerable group of people for contracting the influenza virus.

4.4 Respondents' perception of seasons flu spread, flu symptoms and how the virus spreads

The study also ascertained from respondents their perceptions of when flu spreads, symptoms of the flu and how the virus spreads. Figure 4.2 below presents information on the seasons when the flu virus is likely to spread.
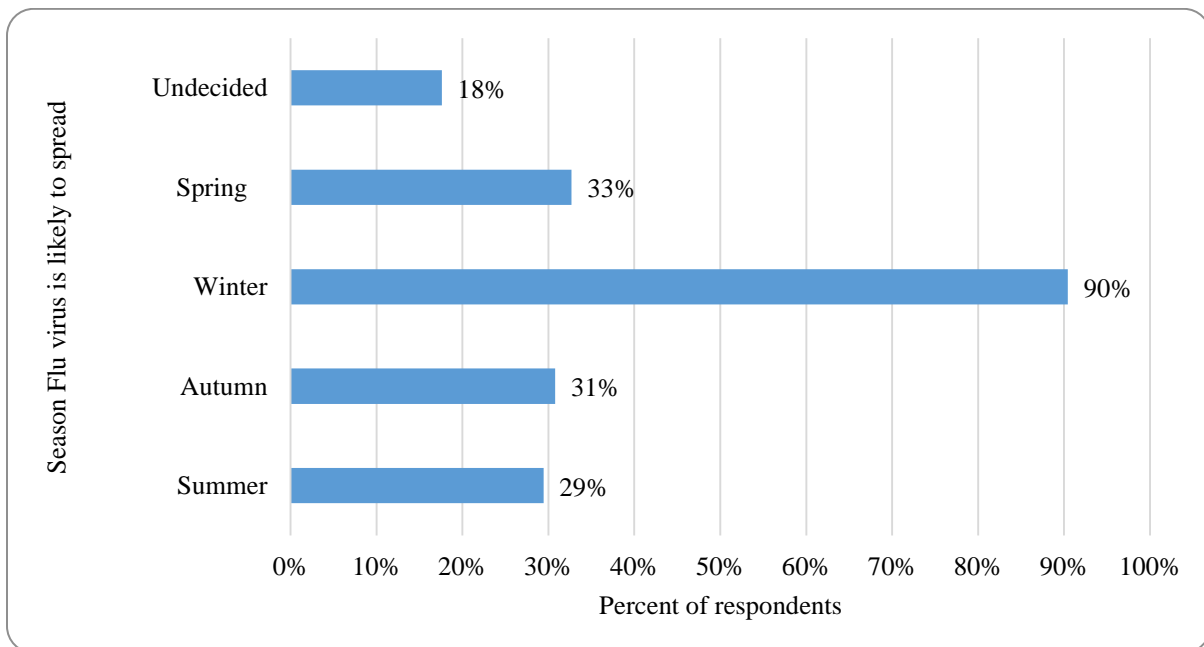
Figure 0.2: Season flu virus is likely to spread
Source: Field survey, 2017

Of the four seasons, winter was selected as the season with the highest likelihood of flu infection, as indicated by nearly 90% of respondents. This is not surprising given the fact that the rate of flu infection is exceptionally high during winter. This was followed by spring, where 33% of respondents indicated this to be the second most important season for contracting or spreading flu. The remaining two seasons, autumn and summer, were preferred by 31% and 29% of respondents respectively. Also, 18% of respondents indicated they were undecided regarding

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which season the flu virus is likely to spread. This may point to a gap in knowledge or a lack of awareness among these respondents of when flu spreads.

In Figure 4.3, respondents' perceptions about the symptoms of flu are presented. The symptom of flu selected by the majority of respondents (93%) was fever. This was followed by runny or stuffy nose, as indicated by 92% of the respondents.
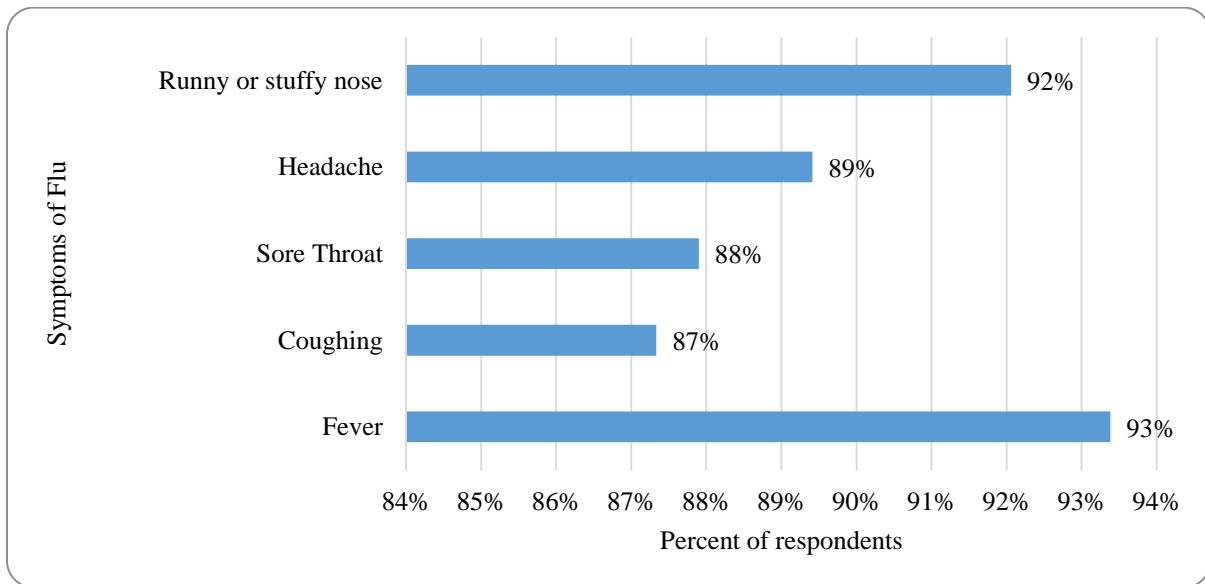
Figure 0.3: Symptoms of flu
Source: Field survey, 2017

Figure 4.3 also illustrates that 89% of respondents indicated that one of the flu symptoms is a headache, while 88% and 87% respectively indicated that a sore throat and coughing are symptoms of flu.

Figure 4.4 below presents information about how flu spreads. The results indicate that 92% of respondents were of the opinion that the flu virus spreads by airborne respiratory droplets. Also, 91% of respondents indicated that the flu virus can spread by sneezing.
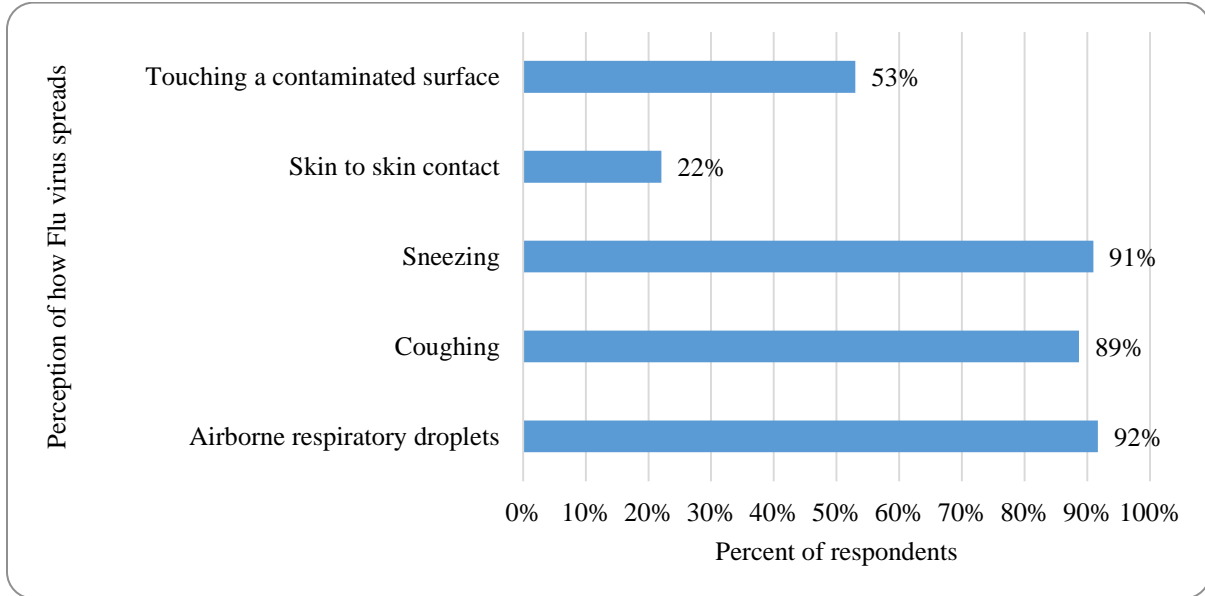
Figure 0.4: Perception of how flu virus spreads
 Source: Field survey, 2017
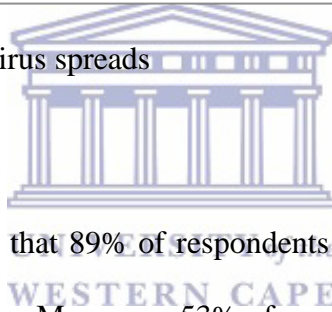
From Figure 4.4, it is also evident that 89% of respondents indicated that coughing can spread the virus from one person to another. Moreover, 53% of respondents indicated that the influenza virus can spread by touching a contaminated surface. The form of flu contraction selected by the least number of respondents (22%) was skin to skin contact.

4.5   Benefits of influenza vaccination

Table 4.3 presents respondents' perceptions about the benefits of influenza vaccination related to preventative action for influenza. Of the 530 students that were interviewed, the majority of respondents (72.8%) agreed or strongly agreed that taking a flu vaccine will protect them from contracting the flu virus, while 26.8% were of the opposite opinion and there was also a small percentage of missing data (0.4%) as two of the respondents left this question unanswered.

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Table 0.3: Respondents' perceptions about the benefits of influenza vaccination

Questions	Strongly Disagree	Disagree	Agree	Strongly Agree	Missing
Taking a flu vaccine will prevent me from contracting the flu virus	29 (5.5%)	113 (21.3%)	239 (45.1%)	147 (27.7%)	2 (0.4%)
Taking a flu vaccine will protect others in my household from contracting the flu virus	99 (18.7%)	154 (29.0%)	186 (35.1%)	89 (16.8%)	2 (0.4%)
Taking a flu vaccine will prevent me from being absent from studying and work	110 (20.8%)	145 (27.3%)	187 (35.3%)	82 (15.5%)	6 (1.1%)
Wash hands frequently can help prevent the spread of the flu	13 (2.5%)	29 (5.5%)	199 (37.5%)	285 (53.8%)	4 (0.7%)
Bed rest could relieve the symptoms of the influenza	32 (6.0%)	94 (17.8%)	263 (49.6%)	132 (24.9%)	9 (1.7%)
Avoiding closed places could protected me from contracting influenza	34 (6.4%)	100 (18.9%)	251 (47.4%)	140 (26.4%)	5 (0.9%)

Source: Field survey, 2017

Table 4.3 also shows that 51.9% of the study respondents agreed or strongly agreed that taking a flu vaccine will protect others in their household from contracting the flu virus, while 47.7% disagreed or strongly disagreed with that statement and two participants did not give a response (0.4%). There was almost an even split in the number of respondents agreeing or disagreeing that taking a flu vaccine will prevent them from being absent from studying and work, with 50.8% agreeing or strongly agreeing and 48.1% disagreeing or strongly disagreeing, while a small number (1.1%) left this question unanswered.

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The majority of study respondents (91.3%) agreed or strongly agreed that washing hands frequently can help prevent the spread of the flu, while only a small proportion (8%) disagreed or strongly disagreed and four respondents left the question unanswered (0.7%).

Just under three quarters (74.5%) of respondents agreed or strongly agreed that bed rest could relieve the symptoms of the influenza, while 23.8% disagreed or strongly disagreed and 1.7% did not respond to this question.

About a quarter of the research respondents (25.3%) disagreed or strongly disagreed that avoiding closed places could protect them from contracting influenza, while almost three quarters (73.8%) either agreed or strongly agreed and a small number of the respondents (0.9%) did not answer the question.
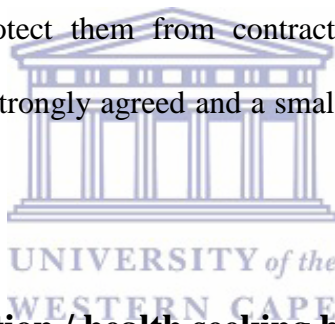
4.6 Barriers and cues to action / health seeking behaviour

4.6.1 Respondents' cues to action

As part of the study, respondents were asked their perceptions about barriers and health seeking behaviours towards the influenza virus. In Figure 4.5, 68% of respondents indicated that they took the flu vaccine after reading about influenza and how serious it is. Also, 70% indicated that they took flu vaccine because they read about the possible complications of contracting the flu.
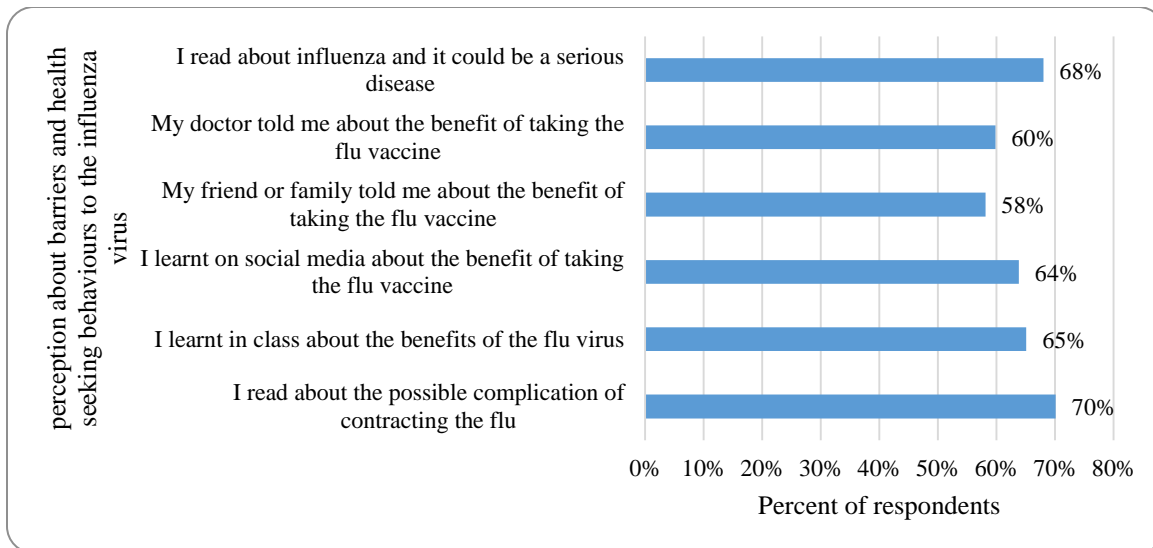
Figure 0.5: Percentage of respondents' health seeking behaviour regarding influenza

The above figure (Figure 4.5) also shows that 60% of the respondents received the vaccination after a doctor recommended the benefits of the flu vaccination. In addition, 65% of respondents indicated that they were vaccinated after they learnt about the benefits of the flu vaccine in their class. A further 64% of respondents had the vaccination after they learnt on social media about the benefits of taking the flu vaccine and 58% of respondents took the vaccine after their family or friend recommended the benefits of flu vaccination.

4.6.2   Respondents' perception of barriers towards uptake of influenza vaccination

Table 4.4 presents respondents' perception about barriers to the influenza vaccination. A majority of the respondents (69.6%) either disagreed or strongly disagreed that taking a flu vaccine is not convenient for them, while less than one third (29.3%) agreed or strongly agreed and 1.1% did not give a response to this question in the survey. Furthermore, 68.3% of respondents either disagreed or strongly disagreed that taking a flu vaccine can be painful, whereas 30% agreed or strongly agreed and there was also a small amount of missing data

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(1.7%) as nine of the respondents did not give an answer to this question.

Table 0.4: Respondents' perception about barriers to the influenza vaccination

Questions	Strongly Disagree	Disagree	Agree	Strongly Agree	Missing
Taking a flu vaccine is not convenient for me.	190 (35.8%)	179 (33.8%)	100 (18.9%)	55 (10.4%)	6 (1.1%)
Taking a flu vaccine can be painful.	161 (30.4%)	201 (37.9%)	129 (24.3%)	30 (5.7%)	9 (1.7%)
Taking a flu vaccine is time consuming.	209 (39.4%)	205 (38.7%)	79 (14.9%)	30 (5.7%)	7 (1.3%)
Taking a flu vaccine interferes with my daily activities.	221 (41.7%)	191 (36.1%)	80 (15.1%)	23 (4.3%)	15 (2.8%)
There are too many risks in taking a flu vaccine.	179 (33.8%)	234 (44.2%)	87 (16.4%)	18 (3.4%)	12 (2.2%)
It costs too much to take a flu vaccine	166 (31.3%)	185 (35.0%)	138 (26.0%)	31 (5.8%)	10 (1.9%)
I am concerned about having a bad reaction from the flu vaccine	106 (20.0%)	177 (33.4%)	162 (30.6%)	73 (13.8%)	12 (2.2%)

Source: Field survey, 2017

From table 4.4 we can also see that 78.1% of respondents either disagreed or strongly disagreed that taking a flu vaccine is time consuming, while 20.6% agreed or strongly agreed and 1.3% chose not to respond to this question. The results show that more than three quarters of the

respondents (77.8%) either disagreed or strongly disagreed that taking a flu vaccine interferes with their daily activities, whereas 19.4% agreed or strongly agreed with the statement and 2.8% of the respondents left the question unanswered. With regard to vaccination risks, 78% of respondents disagreed or strongly disagreed with the notion that there are too many risks in taking a flu vaccine, while 19.8% of them agreed or strongly agreed with the notion and 2.2% did not answer. Additionally, 66.3% of respondents either disagreed or strongly disagreed that taking flu vaccine costs too much money, while 31.8% agreed or strongly agreed and 1.9% did not give a response in this regard. Also, 53.4% of respondents disagreed or strongly disagreed that they were concerned about having a bad reaction from the flu vaccine, while 44.4% agreed or strongly agreed and 2.2% did not give a response to this part of the questionnaire.
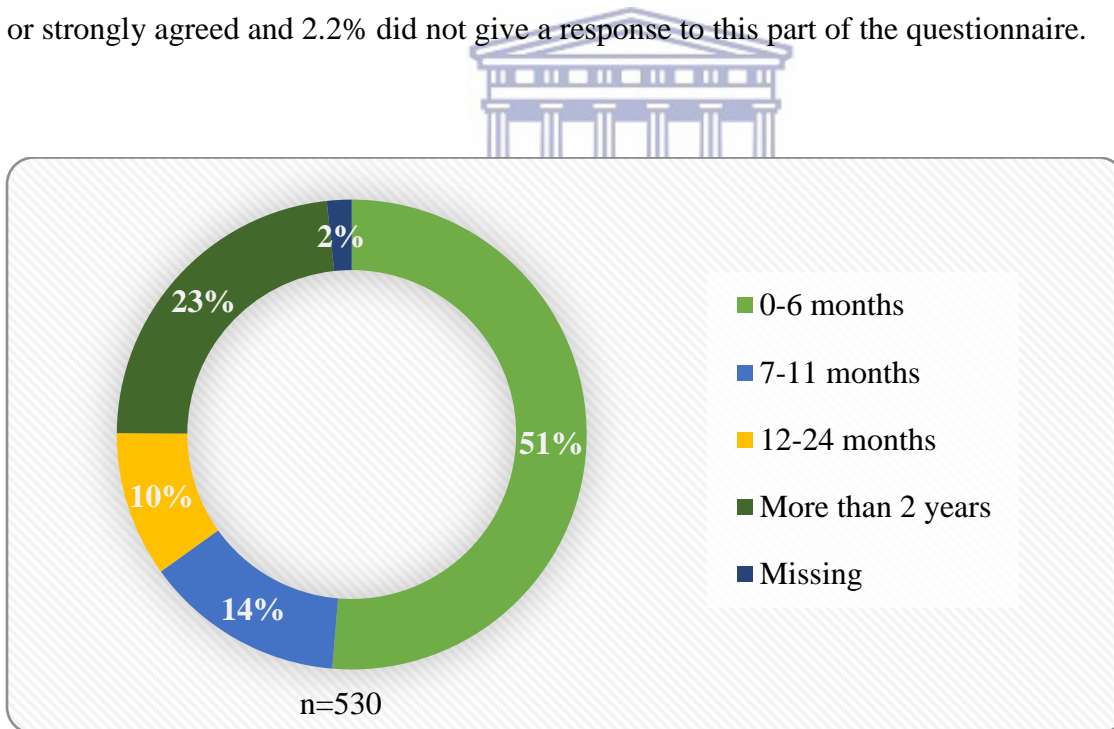
Figure 0.6: Last time respondents contracted the influenza virus

Of the 530 survey respondents, 51% indicated that they contracted the influenza virus in the last six months prior to the survey. Just under a quarter (23%) of the respondents contracted the virus more than two years ago, while 14% and 10% indicated that they contracted the virus in the last

7-11 months and 12-24 months respectively, and 2% of respondents did not answer this question.

4.7 Results of bivariate analyses of differences between attitudes, perceptions and behaviours and selected socio-demographics

To find out whether there are any significant differences between attitudes, perceptions and behaviours and socio-demographics of respondents, two bivariate analyses (t-test and one-way ANOVA) were undertaken based on gender, age, ethnicity and level of education. To do this, composite scores were generated for the four indicators used in understanding the attitudes, perceptions and behaviours of respondents regarding influenza: perception about susceptibility to and severity of the influenza virus; benefits of influenza vaccination; cues to action and respondents' perception of barriers towards uptake of influenza vaccination. Such an aggregation of items allows the researcher to better measure a construct than a single item or question will do (Tavakol & Dennick, 2011).
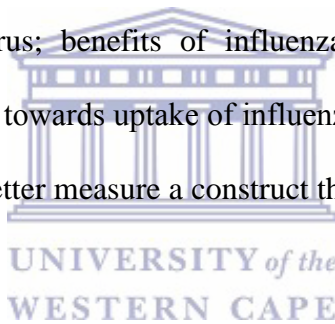
Prior to generating the respective composite indicators, reliability tests were computed using the Cronbach's alpha test. Results of the Cronbach's alpha test for each indicator are presented in Table 4.5.

Table 0.5: Results of Cronbach's alpha tests

Indicators	Coefficient alpha	Cronbach's Alpha based on standardised items	N of items
Perception about susceptibility to and Severity of the influenza virus	0.687	0.690	9
Benefits of influenza vaccination	0.607	0.609	6

Cues to action	0.766	0.766	6
Participants' perception of barriers towards uptake of influenza vaccination	0.793	0.798	7

Source: Own computation based on Field survey, 2017.

It is observable from Table 4.5 that the alpha coefficients for cues to action and respondents' perception of barriers towards uptake of influenza vaccination indicators were 0.766 and 0.793 respectively. In general, the acceptable values for the alpha, range from 0.70 to 0.95 (Tavakol & Dennick, 2011) and the alpha scores from this construct are indicative of internal consistency of the items. The alpha coefficient of respondents' perception about susceptibility to and severity of the influenza virus was 0.687. Even though 12 items were originally intended to measure this construct, three of these were dropped to boost the coefficient alpha to 0.687. According to Tavakol and Dennick (2011), the acceptable alpha values range between $0.70 - 0.95$, but another study by Juul, Van Rensburg and Steyn (2012) stated that slightly lower values can still be acceptable and for the purposes of this study, the researcher accepted working with a coefficient alpha that fell within this category. Consequently, the coefficient alpha of 0.607 for respondents' perception about the benefits of influenza vaccination is deemed acceptable even though quite low.

4.7.1 Gender differences in perception of attitudes, beliefs and behaviours of influenza virus

Table 4.6 presents results of independent samples t-tests computed to explore gender differences

in perception of attitudes, beliefs and behaviours of influenza virus alongside the respective constructs.

Table 0.6: Results of t-tests

Indicator	t-test		Mean		
	t value	p-value	Male	Female	Difference
Perception about susceptibility to and severity of the influenza virus	-1.674	0.095	2.8969	2.9773	-0.08040
Benefits of influenza vaccination	0.497	0.619	2.8964	2.8699	0.02641
Cues to action	-1.446	0.149	1.3852	1.4359	-0.05071
Participants' perception of barriers towards uptake of influenza vaccination	-0.043	0.966	2.0095	2.0122	-0.00269

Source: Own computation based on Field survey, 2017.

The t-test computation for the respondents' perception about susceptibility to and severity of the influenza virus construct yielded a t value of -1.674 with a p-value of 0.095, implying that there are no statistically significant gender differences in respondents' perception about susceptibility to and severity of the influenza virus even though a mean difference of -0.08040 was observed. Similarly, no significant results were observed for the remaining three constructs. For instance, in the case of respondents' knowledge of cues to action, a t value of -1.446 (p-value = 0.149) was realised, indicating no significant difference statistically.

4.7.2 Age group differences in perception of attitudes, beliefs and behaviours of influenza virus

A one-way ANOVA between groups analysis of variance was conducted to explore the variability of age on the perception of attitudes and behaviours towards the influenza virus alongside the respective constructs. respondents were divided into four cohorts according to their age (15 to 20 years; 21 to 25 years; 26 to 30 years and over 30 years). Results from the analysis are presented in Table 4.7

Table 0.7: Results of one-way ANOVA of age group differences in perception of attitudes, beliefs and behaviours

Indicator	Levene statistic	F statistic	Mean			
			15-20 years	21-25 years	26-30 years	30⁺ years
Perception about susceptibility to and severity of the influenza virus	1.669 (0.173)	1.710 (0.164)	2.9547	2.9399	2.9656	3.1333
Benefits of influenza vaccination	1.267 (0.285)	1.607 (0.187)	2.9131	2.8345	2.9129	3.0000
Cues to action	0.679 (0.565)	0.901 (0.441)	1.4355	1.4318	1.4000	1.3384
Participants' perception of barriers towards uptake of influenza vaccination	0.674 (0.568)	0.103 (0.958)	2.0217	2.0151	1.9801	1.9724

Source: Own computation based on Field survey, 2017.

A close look at Table 4.7 shows that there was no statistically significant difference in perception about susceptibility to and severity of the influenza virus scores for the four age groups $F_{(3, 479)} = 1.710$, $p=0.164$. Similarly, no statistically significant differences were observed for the benefits of influenza vaccination $F_{(3, 511)} = 1.607$, $p=0.187$; Cues to action $F_{(3, 523)} = 0.901$, $p=0.441$ and respondents' perception of barriers towards uptake of influenza vaccination $F_{(3, 502)} = 0.103$, $p=0.958$. A possible reason accounting for this result is the unequal sample size for the respective age groups. Also, the fact that the research setting was a university environment may have resulted in less variability in age.

4.7.3 Educational differences in perception of attitudes, beliefs and behaviours of influenza virus
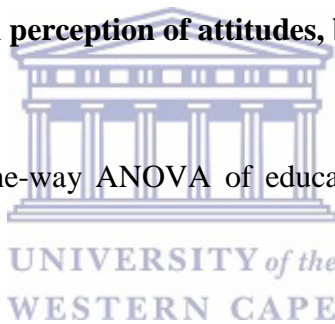
Table 4.8 presents results of a one-way ANOVA of educational differences in perception of attitudes, beliefs and behaviours.

Table 0.8: Results of one-way ANOVA of educational differences in perception of attitudes, beliefs and behaviours

Indicator	Levene statistic	F statistic	Mean					
			F1	F2	BN1	BN2	BN3	BN4
Perception about susceptibility to and severity of the influenza virus	1.128 (0.344)	1.614 (0.155)	2.8530	3.0889	3.0278	2.9835	2.9252	2.9139
Benefits of influenza vaccination	1.106 (0.356)	0.906 (0.477)	2.9479	2.9275	2.9424	2.8217	2.8684	2.8457

Cues to action	1.271 (0.275)	1.532 (.178)	1.4848	1.3264	1.4737	1.3814	1.4145	1.4322
Participants' perception of barriers towards uptake of influenza vaccination	3.053 (0.010)	2.004 (0.082)	2.1818	2.1190	1.9376	1.9762	1.9961	2.0543

Source: Own computation based on Field survey, 2017.

It is observable from Table 4.8 that there were no statistically significant differences for all indicators by level of study. When you take benefits of influenza vaccination scores for instance, no significant differences were observed: $F (5, 511) = 0.906$, $p=0.477$.

4.7.4 Ethnic differences in perception of attitudes, beliefs and behaviours of influenza virus

A one-way ANOVA between groups analysis of variance was conducted to explore the variability of ethnicity on the perception of attitudes, beliefs and behaviours of influenza virus using the four indicators outlined in Table 4.9. respondents were divided into four main ethnic groupings: Black, White, Coloured and Indian.
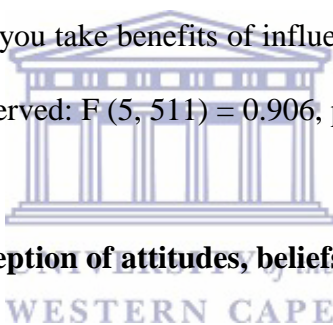
Table 0.9: Results of one-way ANOVA of ethnic differences in perception of attitudes, beliefs and behaviours

Indicator	Levene statistic	F statistic	Mean			
			Black	White	Coloured	Indian
Perception about susceptibility to and severity of the influenza virus	2.156 (0.092)	2.260 (0.081)	2.9759	3.1034	2.8913	2.9333
Benefits of influenza vaccination	2.463 (0.062)	2.546 (0.055)	2.9206	2.7527	2.8005	2.8667
Cues to action	1.156 (0.326)	4.484 (0.004)	1.4087	1.6290	1.4138	1.5667
Participants' perception of barriers towards uptake of influenza vaccination	2.281 (0.078)	3.386 (0.018)	1.9655	2.2535	2.0818	1.7429

Source: Own computation based on Field survey, 2017.

Table 4.9 shows that two of the indicators yielded statistically significant results. A statistically significant difference in cues to action scores was observed for the four ethnic groupings $F_{(3, 523)} = 4.484$, p=0.004. This implies that the different ethnic groupings varied in terms of cues to action score or indicator at the 1% significance level. Also, a statistically significant difference in respondents' perception of barriers towards uptake of influenza vaccination score was observed

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for the four ethnic groupings F (3, 501) = 3.386, p=0.018.

4.8   Conclusion

In this chapter, data were gathered from the nursing students and analysed, and will be used by the researcher to make inferences and draw conclusions about the perceptions, attitudes and health seeking behaviour of the nursing students against various constructs of the HBM. The results from this study will be used to describe and predict the health behaviours of the respondents according to the HBM, which will be discussed in the next chapter.
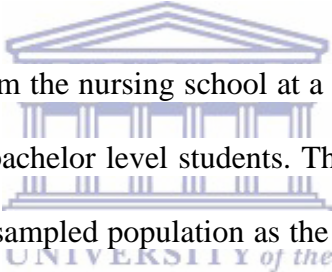
CHAPTER 5: DISCUSSION OF THE RESULTS

5.1   Introduction

This chapter sets out to discuss the results of this research. The results of the research should have a logical flow with the data and be in line with the research literature review (Hagan, 2014). The chapter will lay out the discussion of the research results in sequence and relative to the research questions.

5.2   Socio-demographics

The respondents were recruited from the nursing school at a university in the Western Cape and consisted of foundation level and bachelor level students. The majority of the respondents were females, which is reflective of the sampled population as the majority of students who enroll for nursing courses are females. It is not surprising therefore that males made up a small fraction of the respondents (22.6%). Buthelezi, Fakude, Martin, and Daniels (2015) found that even though in recent years there has been an increase in the number of males taking up nursing, they are still in the minority in comparison to their female counterparts. Buthelezi et al. (2015) further state that this could be due to challenges such as questions about their masculinity or gender, that affect the numbers of males wanting to register for nursing courses at various institutions of learning. The results of this study are consistent with the findings of Buthelezi et al. (2015) with females making up more than three quarters (77.4%) of this study's respondents.

5.3 Susceptibility to and severity to the influenza virus

According to CDC (2013), health care workers are at very high risk of contracting influenza, as the nature of their work requires them to be close to patients. In a study conducted by May, Katz, Johnston, Sanza and Petinaux (2010), 53% of the respondents felt that they had a greater risk of contracting the influenza from the school of medicine or work-related activities. In a similar study on nurses' perceptions on flu vaccination, almost three quarters of the respondents (74%) strongly agreed that they were at risk of contracting influenza (Brown 2014). The results from this study are consistent with these previous cases as a high percentage of the study respondents (79.2%) were in agreement that contact with people on a daily basis increased their risk of contracting the influenza virus. This is a clear indicator that there is an awareness among the nursing students of how the virus is spread.
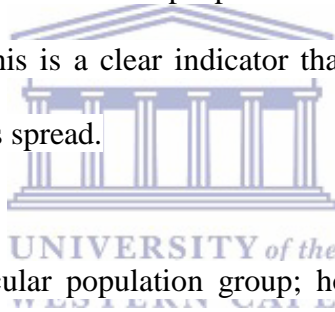
Influenza does not target a particular population group; however, research shows that some people are at higher risk of contracting the virus than others. People with chronic diseases such as diabetes, or those that are receiving medication for conditions like cardiac disease and those that are immunosuppressed are among the list of people that were identified as being at high risk of contracting influenza (Walaza & Cohen, 2016). The results of this study are consistent with their research as about 60% of the respondents were in agreement that people with chronic disease such as diabetes mellitus or asthma are more likely to contract influenza and a further 85.2% were in agreement that people with immunosuppression are at high risk of influenza complications.

Influenza is one of the world's most contagious diseases (Meng et al., 2016) and is considered to

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be one of the main causes of death and illness all over the world (Ginsberg et al., 2009). In a study conducted by Brown (2010), 58% of the respondents felt that "flu is a serious threat to my health" and a further 84% felt that influenza was a serious threat to the health of those around them. In a similar study, 88.2% of the study respondents agreed or strongly agreed that they thought influenza is a serious illness (Albano et al., 2014). This study revealed a similar trend, with 79.2% of the respondents either agreeing or strongly agreeing that contracting flu may lead to other serious health problems, which tells us that the nursing students understand how severe the effects of influenza can be.

The literature reviewed in this study showed that there are quite a number of myths associated with influenza, one of them being the common belief that flu is just like a cold. It is true that the symptoms of the two are similar, but flu can be more intense and could lead to other complications (Eccles, 2006), therefore it is quite common for people to misdiagnose themselves. The results of this research are consistent with the myth as evidenced by the large number of respondents (65.6%) that either agreed or strongly agreed that flu is just like having a heavy cold, with a further 61.5% of the study respondents in agreement that the flu can be treated with antibiotics.

5.4 Respondents perception of seasons flu spreads, flu symptoms and virus spread

The influenza virus is normally spread via coughs, sneezing and close contact with infected individuals (Cameron et al., 2013). There are many myths in existence around the influenza virus and some studies show that there might be a lack of knowledge or information on the subject; for

example, in a study done by Singh et al. (2013), more than half of the respondents believed that swine flu was spread by eating pork.

Some studies show that there is a lack of knowledge among health care workers on the main modes of influenza transmission. One such study conducted among health care workers revealed that only 36.1% of the respondents actually knew the main mode of transmission (Albano et al., 2014).

In South Africa, influenza circulation is highly seasonal, being prevalent mostly in winter (Walaza & Cohen, 2016) and this study's results are consistent with that, with a majority (90%) of the respondents perceiving winter as the season with the highest likelihood of contracting flu infections. This might indicate the respondents' awareness that influenza infections are higher in winter, but it could also be attributed to the common myth that cold weather causes flu. A significant number of the respondents (18%) were undecided as to which season presented the highest likelihood of contracting flu infections. It is this group of undecided respondents that leads one to believe that there might still be a significant gap in knowledge regarding the seasonality of the influenza virus.

Other modes of transmission of the influenza virus include direct contact with objects that have been exposed to the virus like door knobs, keyboards and even cell phones (Nishiura & Inaba, 2011). Further to this, Cowling, Ip, Fang, Suntarattiwong, Olsen, Levy and Nishiura (2013) state that the virus is spread through direct or indirect contact with infected individuals. When people cough or sneeze, they generally cover their nose and mouth, and if they touch other individuals

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then, through this direct contact, they could possibly transmit the virus to others. Over half the respondents (53%) in this study believed that touching a contaminated surface is one of the modes of transmission for the influenza virus and only 22% believed that skin to skin contact was a mode of transmission for influenza.

In this study, perceptions on the spread of flu seem to be somewhat different from those seen in the results cited in studies consulted during research. In this study, it seems that the respondents' higher levels of knowledge and education on the transmission of influenza in comparison to other studies is evidenced by 92% of respondents citing airborne respiratory droplets as a mode of transmission, 91% citing sneezing and 89% citing coughing as a mode of transmission of the influenza virus. This might be due to the fact that the respondents were still actively studying and thus the knowledge gained might still be fresh in their minds; however, there are still some areas of concern as it seems that the least perceived mode of spreading the virus is skin to skin contact.
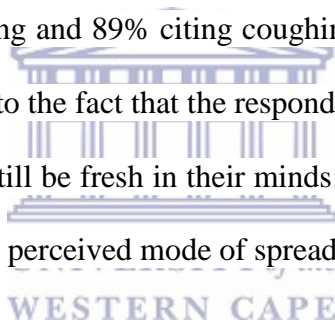
5.5   Benefits of the influenza vaccination

Teitler-Regev, Shahrabani and Benzion (2011) conducted a study on factors affecting students' intention to be vaccinated against influenza and in that study, one of the top reasons that was given by the respondents as a motivator for getting the flu vaccine was reducing the chances of contracting the virus. In yet another similar study, almost half of the respondents felt that taking the vaccine could protect them from getting influenza (Brown, 2010). In this research, on the benefits of the influenza vaccination, the results indicated that a large number of the study respondents (73.1%) either agreed or strongly agreed that taking a flu vaccination will prevent them from contracting the virus. This suggests that most of the respondents were aware of the

benefits of the vaccination, which is consistent with Teitler-Regev et al. (2011) and Brown (2010).

Vaccination can prevent people from contracting the virus and getting ill and can therefore contribute indirectly in reducing productivity costs in terms of absenteeism from work or institutions of learning for students (Teitler-Regev et al., 2011). Some research was done to assess knowledge and behaviour regarding influenza by Brown (2010) and the results revealed that most of the respondents thought that the vaccine would be beneficial for them. The results in this research seem to be consistent with the previous studies in this regard as evidenced by the fact that over half of the respondents indicated that taking a flu vaccine will prevent them from missing both work and studies. Furthermore, more than half of the respondents believed that by taking the vaccine, not only do they protect themselves, but other members of their households as well.
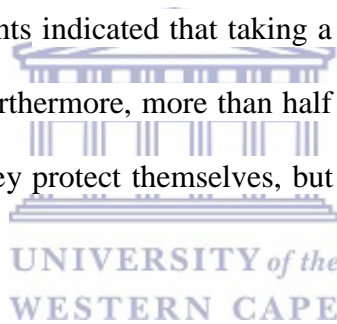
The CDC (CDC, 2013) indicated that hand washing is the single most effective way to prevent the spread of infection. The majority of nursing students (91.3%) in this study who agreed or strongly agreed that frequent hand washing can help prevent the spread of the flu seems consistent with the views of the CDC (2013). This might be because they are encouraged to practice handwashing etiquette in the health and study institutions.

5.6   Barriers and cues to action/health seeking behaviour

According to the Health Belief Model, barriers to the uptake of a vaccine can be defined as characteristics of the vaccine which may deter an individual from using it and cues to action refer

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to any stimuli, internal or external, which serve as motivators for one to take the vaccine (Shahrabani, Benzion, & Din 2009).

A study conducted by Hollmeyer, Hayden, Poland and Buchholz (2009) on influenza vaccination of health care workers identified misconceptions or lack of knowledge and lack of convenient access to the vaccination as the main deterrents to vaccine uptake by health care workers. Marentette (2011) also cites inconvenience as a major barrier to the vaccine. The results in this study differ from those of Hollmeyer et al. (2009) and Marentette (2011). Most of the respondents in this study did not agree that taking the vaccine interferes with their daily activities or is not convenient (77.8% and 69.6% respectively). However, there was still a significant number of respondents that felt differently, with 20% indicating that they agreed or strongly agreed that taking a flu vaccine interferes with their daily activities and 29.5% of the respondents that agreed or strongly agreed that taking the flu vaccination is not convenient for them.
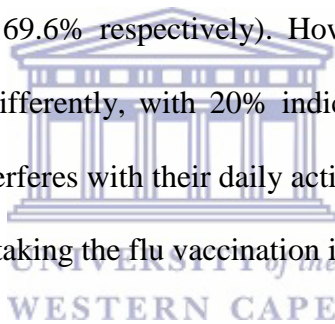
The fear of adverse effects of the vaccine was cited as one of the reasons that stood in the way of the study respondents receiving the vaccination in a study conducted by Albano et al. (2014). Similarly, in another study by Jaiyeoba et al. (2014), 18% of the respondents declined vaccination due to the very same reason. It seems that this fear of adverse effects of the virus is quite prevalent among the public and is one of the reasons that people do not get the flu vaccine. In a study conducted by Athota (2016) on the effect of personal beliefs and perceptions on influenza vaccine uptake, side effects came up again as one of the reasons or barriers to vaccine uptake. The results from this study are consistent with those of Athota (2016) and others cited in this study, with almost half of the study respondents (44.4%) being concerned that they might

have a bad reaction to the vaccine and about a fifth of the study respondents agreeing or strongly agreeing that there are too many risks associated with taking the flu vaccine. This supports the notion that there are still quite a lot of misconceptions around the lack of sufficient knowledge about the influenza vaccine (Hollmeyer et al., 2009).

The external cues to action for respondents in this study was that their motivation to get vaccinated came from interpersonal influences such as doctors, family members or peers and teachers in class (Athota, 2016). Most of the respondents (70%) took the vaccine after reading about the complications of contracting the virus while 68% took a vaccination after reading about it. This tells us that education and increasing awareness around the benefits of the vaccination is a significant contributor in motivating students to get the flu vaccine although the authoritative figures and institutions of education such as doctors and classes did not contribute as much as own reading. This is made apparent by the fact that 60% of the respondents indicated they took the vaccine after their doctor told them about the benefits, and 65% said that they took it after learning about the benefits of the vaccine from class. According to McNab (2009), social media can make health information available to more people than ever before and the provision of credible health information can be vital in helping people to take action during an outbreak or to prevent illness. The study results show that 64% of the respondents decided to take the vaccine after learning of its benefits on social media; while 58% of the respondents took the vaccine after their friend or family member told them about the benefits of the flu vaccine, which supports the notion that more people now use the Internet as a source of health information (McNab, 2009).

5.7 Differences in attitudes, perceptions, and behaviours against selected socio-demographic characteristics

The study also investigated the differences in the attitude, perceptions and behaviours against some demographic characteristics of the respondents. The socio-demographic areas that were looked at were; age, gender, education level and ethnicity. The results showed that there were two indicators with statistically significant results.

No statistically significant differences were noted in terms of gender or age group regarding respondents' perceptions, attitudes and behaviours about susceptibility to and severity of influenza. As previously mentioned, one possible reason for this might be the fact that the research setting was a nursing school at a university and the study was done among nursing students, which could account for the low variability observed. Also, there were no statistically significant differences for all indicators by level of study.
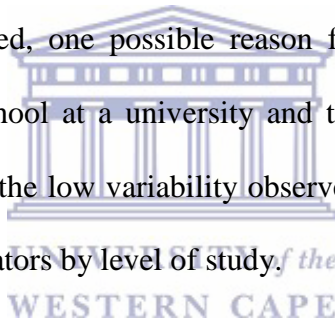
A study conducted by Lu, O'Halloran, Williams, Lindley, Farrall and Bridges (2015) shows that there are ethnic disparities regarding perceptions about influenza as well its vaccine uptake. The results of this study are consistent with this as they show that there are significant differences in the respondents' perceptions, attitudes and behaviours towards the uptake of the influenza vaccination among the ethnic groups F (3, 501) = 3.386, p=0.018. Similar results have been shown on the differences in attitudes between the ethnic groups on uptake of the influenza vaccine (Gerber, 2012).

Research has been done to investigate if there are differences in perceptions towards the cues to

action on the uptake of the flu vaccine. One such study was conducted by Athota (2016) and showed that there were in fact significant ethnic differences on the cues to action towards the flu vaccine. The results from this study are also consistent with those findings as a significant difference in respondents' perceptions of cues to action to influenza vaccination score was observed for the four ethnic groupings that took part in this study (F (3, 523) = 4.484, p=0.004).

5.8   Conclusion

This chapter has provided a detailed discussion of the main points in the results of this research in a logical and sequential manner. The analysed results were discussed sequentially in the following order: susceptibility to and severity of the influenza virus; respondents' perception of seasons in which flu spreads; flu symptoms and virus spread; benefits of the influenza vaccination; barriers and cues to action/health seeking behaviour and differences in attitude, beliefs and behaviours against selected socio-demographic characteristics.

The next chapter presents the conclusions that are drawn from the discussion of the findings and the recommendations of the research study.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This study responded to three objectives, which were to determine the attitudes and perceptions of nursing students on the following: severity, susceptibility and risk of influenza; perceived benefits and barriers to the influenza vaccination; and identify the cues to action and determine the relationship between demographic and attitudinal variables and nursing students' intention to receive the influenza vaccination. This chapter draws conclusions based on the results linked to the study objectives and provides recommendations based on each objective.

The results of this study have adequately met the study objectives and are important because they help in identifying nursing students' beliefs about influenza. As a result, this knowledge can be used to increase and contribute to improving knowledge on methods that positively influence their health seeking behaviour.

6.2 The conclusions and recommendations of the study

6.2.1 Severity, susceptibility and risk of influenza

Under the category of perceived severity, there were no statistically significant differences for gender and the results from this study were quite similar to those of other studies, which indicated a general understanding of the consequences, which might arise due to a person being infected by the influenza virus. In line with other studies that were looked at in the literature review of this study, the nursing students perceived elderly people and young children to be more likely to be susceptible to the influenza. There are, however, still some misconceptions around

influenza as evidenced by the concerning number of nursing students that felt that the flu was just like a heavy cold and could be treated with antibiotics.

This study also found no statistically significant differences in the respondents' perceptions on severity and susceptibility towards influenza according to gender. Other studies have shown statistically significant differences in gender along this HBM construct such as the study by Murray et al., (2015), which showed that women were more susceptible to the virus. One reason the findings may differ from other studies is that the population group in this research were all nursing students with a certain level of health literacy, which might put them in a position of being more knowledgeable about their susceptibility to and the severity of the virus. This trend is shown in quite a few other studies and, according to Murray et al. (2015), it could be due to the over representation of females in the health care profession. This over representation of females is also illustrated in this study by the proportion of female nursing students that belonged to the nursing school and those that took part in the study.

Recommendation for Education

Educational programmes could be introduced to further increase the nursing students' awareness of their susceptibility towards the virus and to assist them in separating fact from myth. Educational drives such as these could be implemented in other population groups - which are considered to be in the high-risk category. The study respondents in this and other studies identified these high risks groups as young children under the age of two, elderly people (adults over 65 years old) and people with medical conditions like asthma or heart disease. The educational drives and initiatives could be actively implemented via social media platforms,

which this and other studies have shown to be a very popular mode of transmission of health information as well as encouraging cues to action towards uptake of the influenza vaccination.

6.2.2   Perceived benefits and barriers to the influenza vaccination

The most important aspect about taking the influenza vaccination is that it can prevent a person from contracting the virus and falling ill. In addition, hand washing is also a very effective way to prevent the spread of the virus. In this study the results concurred with this line of thought and were consistent with other studies cited, where most of the nursing students' perceptions, attitudes and behaviours were high regarding hand washing as an effective means of preventing the spread of flu. Other benefits of taking the vaccination were also highlighted, such as not affecting their work and protecting other members of their households.
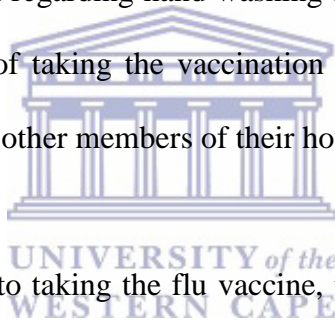
Although there are many benefits to taking the flu vaccine, there are also many barriers, which tend to overshadow these benefits. In this study, most of the respondents felt it is beneficial to take the vaccine, however, if we take a closer look, we realise that almost half of the student nurses were concerned that they might have a bad reaction to the vaccine. This is quite common as other studies cited have also shown this to be a main reason when it comes to barriers for influenza vaccine uptake using the HBM. This means that there are fairly large numbers of people deciding against vaccination for fear of being sick or having an adverse reaction.

Recommendation for Research

More research should be done in future aimed at analysing the reaction of nursing students who took the vaccine and had a bad reaction or got sick due to it. This could provide information

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which could change their perception or attitude towards the vaccine based on the new information.

6.2.3 Cues to action and demographic attitudinal variables and nursing students' intention to receive the influenza vaccination

Cues to action or the motivation to get vaccinated could come from many sources. For example, a person might fall ill and then decide to get vaccinated so as to prevent this from happening in the future or, as Athota (2016) states, they could come from interpersonal influences such as family, friends or doctors. The same was true in this study, where nursing students' strongest cue to action was through reading. This is not surprising because, as nursing students, they would have regular access to literature on influenza and other diseases both in class or in the clinics and hospitals when doing their practical work. Social media followed closely as a motivator of health seeking behaviour in the nursing students. Over recent years, social media has grown to be an instrumental player in the spread of information and medical or health information has not been left behind in this popular trend of sharing information. Mcnab (2009) stated that social media can make health information available to more people than ever before and credible information can be used by people to take action in an outbreak to prevent illness. When it comes to interpersonal cues to action, the results imply that nursing students are more likely to have the influenza vaccination after learning about influenza in class.

Recommendation for Research and Education

Future studies could be done to find out at what stage of their studies, students should learn about the vaccination. More questions could be added to the questionnaire to find out if they have

learnt about the vaccine and this information could then be used to predict their intentions to get vaccinated. This may be used to make recommendations to educators to make changes in the curriculum to make sure that nursing students are taught about the influenza virus and its vaccine early on in their studies to try to foster a habit of vaccine uptake among nursing students.

In the analysis of selected socio-demographic characteristics of the respondents of this study against the four constructs of the HBM, there are similarities and differences with some previous studies. An example where there are consistencies would be with the gender differences in health seeking behaviour as this study found that there were no statistically significant differences between males and females regarding their perceptions, attitudes and behaviours towards susceptibility to and severity of the influenza virus. However, other studies, such as Brown (2010), show a statistically significant difference in perceived severity when evaluated against a participant's gender.
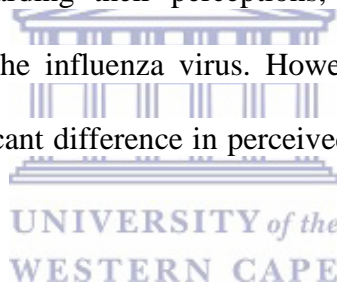
Cues to action and respondents' perceptions of barriers towards uptake of the influenza vaccination were found to be statistically significant when they were compared against the nursing students' ethnicity. The findings suggest that Whites and Indians are more likely to receive the vaccine in comparison to the other ethnic groups. This could be due to cultural differences as well as financial status. On the cultural front, for example, in South Africa it is quite normal for black people to use traditional healers, in some cases exclusively and in others in conjunction with biomedicine. Abubakar, Van Baar, Fischer, Bomu, Gona, and Newton (2013) conducted a study on health seeking behaviour in two traditional communities in Kenya and found that although biomedical treatment was preferred, traditional healers are still consulted

by these communities, especially when it seems that Western medicine has failed or for particular types of illnesses.

Recommendation for Research

Future research could be done to see if this is the case and the socio-demographic section of the research tool could include some questions to establish the nursing students' monthly income, if any, or even their total households' monthly income, in order to gain a better understanding about the financial status of the respondents. To better understand how culture might have an effect, questions could be added to the questionnaire which ask the respondents about their use of traditional healers and traditional medicine regarding influenza. This data can then be used to gain some insight on how the cultural and financial backgrounds of different ethnic groups can be used as a predictor of these groups' health seeking behaviour.
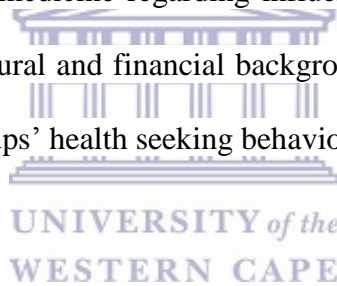
Recommendation for policy

A recommendation is for the school of nursing to increase the students' awareness about influenza and to investigate the possibility of including a requirement for the programme - that students must take the influenza vaccination annually for protection.

6.3 Conclusion

In conclusion, this study has shown the respondents' perceptions, attitudes and health seeking behaviour towards influenza. The results of this study is similar to previous studies conducted on the topic. Furthermore, the recommendations are to increase the education of students about the benefits of influenza vaccination and to encourage them to educate themselves about influenza

by using social media or any other sources to get enough information about how dangerous influenza can be and how can they deal with it.

LIST OF REFERENCES

Abubakar, A., Van Baar, A., Fischer, R., Bomu, G., Gona, J. K., & Newton, C. R. (2013). Socio-cultural determinants of health-seeking behaviour on the Kenyan coast: a qualitative study. *PloS one*, *8*(11), e71998.

Afolabi, M. O., Daropale, V. O., Irinoye, A. I., & Adegoke, A. A. (2013). Health-seeking behaviour and student perception of health care services in a university community in Nigeria. http://dx.doi.org/10.4236/health.2013.55108

Albano, L., Matuozzo, A., Marinelli, P., & Di Giuseppe, G. (2014). Knowledge, attitudes and behaviour of hospital health-care workers regarding influenza A/H1N1: a cross sectional survey. *BMC infectious diseases*, *14*(1), 208.
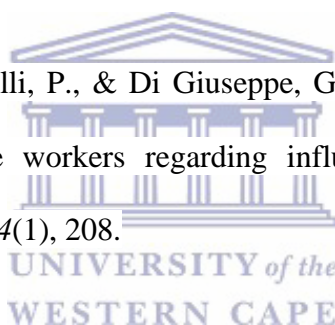
Ashshi, A., Azhar, E., Johargy, A., Asghar, A., Momenah, A., Turkestani, A., Alghamdi, S., Memish, Z., Al-Ghamdi, A., Alawi, M., & El-Kafrawy, S. (2014). Demographic distribution and transmission potential of influenza A and 2009 pandemic influenza A H1N1 in pilgrims. *The Journal of Infection in Developing Countries*, *8*(09), 1169-1175.

Athota, R. S. (2016). The Effect of Personal Beliefs and Perceptions on Influenza Vaccination Uptake among Older Adults.

Babbie, E. (2010). The Practice of Social Research Wadsworth Cengage Learning. *International Edition*.

106

Baudon, E., Poon, L.L., Dao, T.D., Pham, N.T., Cowling, B.J., Peyre, M., Nguyen, K.V. & Peiris, M., (2015). Detection of novel reassortant influenza A (H3N2) and H1N1 2009 pandemic viruses in swine in Hanoi, Vietnam. *Zoonoses and public health*, *62*(6), 429-434.

Biggerstaff, M., Cauchemez, S., Reed, C., Gambhir, M., & Finelli, L. (2014). Estimates of the reproduction number for seasonal, pandemic, and zoonotic influenza: a systematic review of the literature. *BMC infectious diseases*, *14*(1), 480.

Bird, E. (2015). Kristin A Riekert, Judith K Okene and Lori Pbert (eds), The Handbook of Health Behavior Change, Springer Publishing Company, LLC: New York, 2014; 520 pp.

Bish, A., & Michie, S. (2010). Demographic and attitudinal determinants of protective behaviours during a pandemic: a review. *British journal of health psychology*, *15*(4), 797-824.

Blaxter, L. (2010). *How to research*. McGraw-Hill Education (UK).

Booy, R. (2016). Flu myths. *PS Post Script*, (Jun 2016), 24.

Bouvier, N. M., & Lowen, A. C. (2010). Animal models for influenza virus pathogenesis and transmission. *Viruses*, *2*(8), 1530-1563.

Brown, I. H. (2010). Summary of avian influenza activity in Europe, Asia, and Africa, 2006–

2009. *Avian diseases*, *54*(s1), 187-193.

Brown, L. L. (2014). Nurse Perceptions of Influenza Vaccination.

Buglar, M. E., White, K. M., & Robinson, N. G. (2010). The role of self-efficacy in dental patients' brushing and flossing: testing an extended Health Belief Model. *Patient education and counseling*, *78*(2), 269-272.

Buthelezi, S. F., Fakude, L. P., Martin, P. D., & Daniels, F. M. (2015). Clinical learning experiences of male nursing students in a Bachelor of Nursing programme: Strategies to overcome challenges. *Curationis*, *38*(2), 1-7.
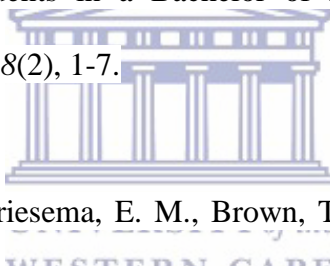
Cameron, K. A., Roloff, M. E., Friesema, E. M., Brown, T., Jovanovic, B. D., Hauber, S., & Baker, D. W. (2013). Patient knowledge and recall of health information following exposure to "facts and myths" message format variations. *Patient education and counseling*, *92*(3), 381-387.

Centers for Disease Control and Prevention [CDC] (2009). Update: swine influenza A (H1N1) infections--California and Texas, April 2009. *MMWR. Morbidity and mortality weekly report*, *58*(16), 435.

Centers for Disease Control and Prevention [CDC] (2010). Prevention and control of influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 59(8).

Centers for Disease Control and Prevention [CDC] (2013). Prevention and control of seasonal influenza with vaccines. Recommendations of the Advisory Committee on Immunization Practices--United States, 2013-2014. *MMWR. Recommendations and reports: Morbidity and mortality weekly report. Recommendations and reports/Centers for Disease Control*, *62*(RR-07), 1.

Centre for Disease Control (2013). *Influenza exposure Management option.* https://www.cdc.gov/nhsn/pdfs/hps-manual/exposure/4-hps-influenza-vaccination-exposure-option.pdf

Centre for Disease Control (2015). Preventing the Flu: Good Health Habits Can Help Stop Germs. https://www.cdc.gov/flu/protect/habits.htm

Centre for Disease Control and prevention (2016). Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices — United States, 2016–17 Influenza Season. MMWR 2016. August 26, 2016 / 65(5); 1–54.

Champion, V. L., & Skinner, C. S. (2008). The health belief model. *Health behavior and health education: Theory, research, and practice*, *4*, 45-65.

Chance, J., & Williamson, S. (2005). A user-friendly approach to improving healthcare worker influenza vaccination compliance. *American Journal of Infection Control*, *33*(5), e62.

Cheung, K., Ho, S. M. S., & Lam, W. (2017). Factors affecting the willingness of nursing students to receive annual seasonal influenza vaccination: A large-scale cross-sectional study. *Vaccine*, *35*(11), 1482-1487.

Cohen, Y. Z., & Dolin, R. (2013). Novel HIV vaccine strategies: overview and perspective. *Therapeutic advances in vaccines*, *1*(3), 99-112.

Collin, N., de Radiguès, X., & World Health Organization H1N1 Vaccine Task Force. (2009). Vaccine production capacity for seasonal and pandemic (H1N1) 2009 influenza. *Vaccine*, *27*(38), 5184-5186.

Cowling, B. J., Ip, D. K., Fang, V. J., Suntarattiwong, P., Olsen, S. J., Levy, J., ... & Nishiura, H. (2013). Aerosol transmission is an important mode of influenza A virus spread. *Nature communications*, *4*, 1935.

Creswell, J. W. (2014). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Research design Qualitative quantitative and mixed methods approaches. https://doi.org/10.1007/s13398-014-0173-7.2

Delgado-Rico, E., Carrctero-Dios, H., & Ruch, W. (2012). Content validity evidences in test development: An applied perspective. *International journal of clinical and health psychology*, *12*(3).

110

Demarcus, L., Soderlund, L., & Voss, J. (2015, December). Assessment of 10 Influenza-Like Illness Case Definitions Using Department of Defense (DoD) Global, Laboratory-Based, Influenza Surveillance Data. In *Open Forum Infectious Diseases* (Vol. 2, No. suppl_1). Oxford University Press.

Demicheli, V., Jefferson, T., Al- Ansary, L. A., Ferroni, E., Rivetti, A., & Di Pietrantonj, C. (2014). Vaccines for preventing influenza in healthy adults. *The Cochrane Library*.

Determining the provincial and national burden of influenza-associated severe acute rapid assessment methodology. *PLoS ONE*, *10*(7).
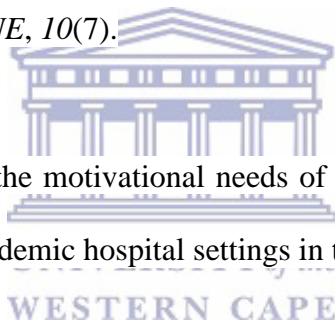
Dominick, R. (2015). Comparing the motivational needs of 2nd and 3rd year learner nurses on working day and night shifts in academic hospital settings in the Western Cape.

Dunkle, L. M., Izikson, R., Patriarca, P., Goldenthal, K. L., Muse, D., Callahan, J., & Cox, M. M. (2017). Efficacy of recombinant influenza vaccine in adults 50 years of age or older. *New England Journal of Medicine*, *376*(25), 2427-2436.

Eaton, J. L., Mohr, D. C., McPhaul, K. M., Kaslow, R. A., & Martinello, R. A. (2017). Access, Education and Policy Awareness: Predictors of Influenza Vaccine Acceptance Among VHA Healthcare Workers. *Infection Control & Hospital Epidemiology*, *38*(8), 970-975.

Eccles, R. (2006). Efficacy and safety of over- the- counter analgesics in the treatment of

common cold and flu. *Journal of clinical pharmacy and therapeutics*, *31*(4), 309-319.

El Kahi, H. A., Rizk, G. A., Hlais, S. A., & Adib, S. M. (2012). Health-care-seeking behaviour among university students in Lebanon/Comportement en matière de recherche de soins des étudiants d'une université au Liban. *Eastern Mediterranean Health Journal, 18*(6), 598.

Ellis, P. (2010). Understanding Research for Nursing Students.

Engelkirk, P. G., Duben-Engelkirk, J. L., & Burton, G. R. W. (2011). Burton's microbiology for the health sciences. Lippincott Williams & Wilkins.

Erkin, Ö., & Özsoy, S. (2012). Validity and reliability of health belief model applied to influenza. Academic Research International, 2(3), 31.
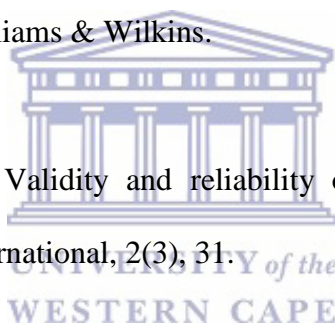
Eurosurveillance Editorial Team. (2017). WHO recommendations on the composition of the 2017/18 influenza virus vaccines in the northern hemisphere. *Eurosurveillance*, *22*(10).

Fauci, A. S. (2006). Seasonal and pandemic influenza preparedness: science and countermeasures. *The Journal of infectious diseases*, *194*(Supplement_2), S73-S76.

Feikin, D. R., Ope, M. O., Aura, B., Fuller, J. A., Gikunju, S., Vulule, J., Ng'ang'a Z., Njenga M. K., Breimana R. F. and Katz, M. (2012). The population-based burden of influenza-associated hospitalization in rural western Kenya, 2007–2009. Bulletin of the World Health Organization,

90(4). http://doi.org/10.2471/BLT.11.094326

Fiore, A.E., Shay, D.K., Broder, K., Iskander, J.K., Uyeki, T.M., Mootrey, G., Bresee, J.S. and Cox, N.S. (2008). Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP), 2008. *MMWR. Recommendations and reports: Morbidity and mortality weekly report. Recommendations and reports*, *57*(RR-7), 1-60.

Fuhrmann, C. (2010). The effects of weather and climate on the seasonality of influenza: what we know and what we need to know. *Geography Compass*, *4*(7), 718-730.

Gerber, K. (2012). A Multi-Level Examination of Influenza Vaccination Disparities from the 2009 Behavioral Risk Factor Surveillance System.
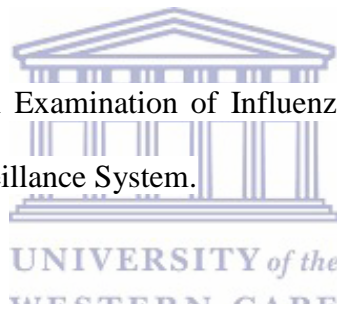
Gilca, V., Boulianne, N., Dubé, E., Sauvageau, C., & Ouakki, M. (2009). Attitudes of nurses toward current and proposed vaccines for public programs: a questionnaire survey. *International journal of nursing studies*, *46*(9), 1219-1235.

Ginsberg, J., Mohebbi, M. H., Patel, R. S., Brammer, L., Smolinski, M. S., & Brilliant, L. (2009). Detecting influenza epidemics using search engine query data. *Nature*, *457*(7232), 1012-1014.

Gray J. R., Grove S. K., & Sutherland S. (2017). Burns and Grove's the practice of nursing research: Appraisal, synthesis and generation of evidence (8th ed.). St. Louis, MO: Elsevier

113

Green, E. C., & Murphy, E. (2014). Health belief model. *The Wiley Blackwell Encyclopedia of Health, Illness, Behavior, and Society*.

Hagan, D. (2014). *Factors that influence parents' decisions on childhood immunizations at Kumasi metropolis in Ghana* (Doctoral dissertation, University of the Western Cape).

Havers, F. P., Campbell, A. P., Uyeki, T. M., & Fry, A. M. (2017). Commentary: A Historical Review of Centers for Disease Control and Prevention Antiviral Treatment and Postexposure Chemoprophylaxis Guidance for Human Infections with Novel Influenza A Viruses Associated with Severe Human Disease. *The Journal of Infectious Diseases*, *216*(suppl_4), S575-S580.
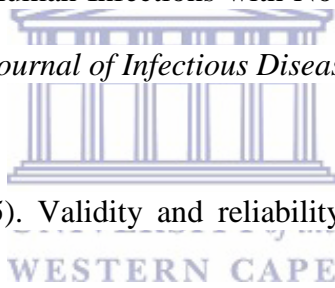
Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence-based nursing*, ebnurs-2015.

Hidiroglu, S., Ay, P., Topuzoglu, A., Kalafat, C., & Karavus, M. (2010). Resistance to vaccination: the attitudes and practices of primary healthcare workers confronting the H1N1 pandemic. *Vaccine*, *28*(51), 8120-8124.

Hollmeyer, H. G., Hayden, F., Poland, G., & Buchholz, U. (2009). Influenza vaccination of health care workers in hospitals—a review of studies on attitudes and predictors. *Vaccine*, *27*(30), 3935-3944.

Hughes, C. (2012). Qualitative and quantitative approaches. *URL: http://tinyurl. com/bmztxp8*.

Ingham-Broomfield, R. (2014). A nurses' guide to quantitative research. *Australian Journal of Advanced Nursing, The*, *32*(2), 32.

Jaiyeoba, O., Villers, M., Soper, D. E., Korte, J., & Salgado, C. D. (2014). Association between health care workers' knowledge of influenza vaccine and vaccine uptake. *American journal of infection control*, *42*(1), 69-70.

Jef Jefferson, T., Jones, M.A., Doshi, P., Del Mar, C.B., Hama, R., Thompson, M., Spencer, E.A., Onakpoya, I., Mahtani, K.R., Nunan, D.N., & Howick, J. (2014). Neuraminidase inhibitors for preventing and treating influenza in healthy adults and children. *Sao Paulo Medical Journal*, *132*(4), 256-257.
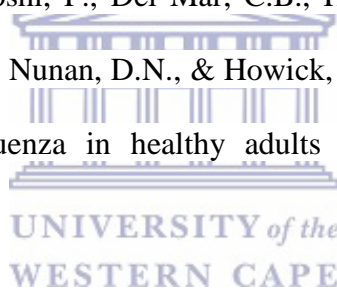
Jones, C. L., Jensen, J. D., Scherr, C. L., Brown, N. R., Christy, K., & Weaver, J. (2015). The health belief model as an explanatory framework in communication research: exploring parallel, serial, and moderated mediation. *Health communication*, *30*(6), 566-576.

Jong, E. C., & Stevens, D. L. (2011). *Netter's Infectious Diseases E-Book*. Elsevier Health Sciences.

Juul, L., Van Rensburg, J. A., & Steyn, P. S. (2012). Validation of the king's health questionnaire for South Africa in English, Afrikaans and isiXhosa. *South African Journal of*

Obstetrics and Gynaecology, *18*(3).

Kallewaard, N.L., Corti, D., Collins, P.J., Neu, U., McAuliffe, J.M., Benjamin, E., Wachter-Rosati, L., Palmer-Hill, F.J., Yuan, A.Q., Walker, P.A., & Vorlaender, M. K. (2016). Structure and function analysis of an antibody recognizing all influenza A subtypes. *Cell*, *166*(3), 596-608.

Kamimura, A., Trinh, H. N., Weaver, S., Chernenko, A., Nourian, M. M., Assasnik, N., & Nguyen, H. (2017). Knowledge and Perceptions of Influenza Vaccinations Among College Students in Vietnam and the United States. *Journal of Preventive Medicine and Public Health*, *50*(4), 268.
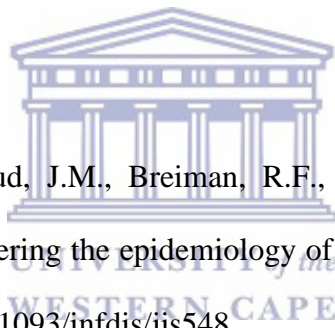
Katz, M.A., Schoub, B.D., Heraud, J.M., Breiman, R.F., Njenga, M.K., Widdowson, M.A. (2012). Influenza in Africa: uncovering the epidemiology of a long-overlooked disease. J Infect Dis.2012, 206 Suppl 1): S1-S4. 10.1093/infdis/jis548.

Khandaker, G., Dierig, A., Rashid, H., King, C., Heron, L., & Booy, R. (2011). Systematic review of clinical and epidemiological features of the pandemic influenza A (H1N1) 2009. *Influenza and other respiratory viruses*, *5*(3), 148-156.

Kimberlin, C. L., & Winterstein, A. G. (2008). Validity and reliability of measurement instruments used in research. *American Journal of Health-System Pharmacy*, *65*(23), 2276-2284.

Klemenc-Ketis, Z., & Kersnik, J. (2014). Health seeking behaviour in general population with

psychological symptoms. *Psychiatria Danubina*, *26*(2), 0-186.

Kurniasari, M. D. (2018). Self-regulation as Correlates to Students' Voices and Achievement in TOEFL Score. *Humaniora*, *30*(1), 50-57.

Kwok, W. C., Lam, S. H., Wong, M. P., Ip, M. S., & Lam, D. C. (2016). Influenza B/Streptococcal co- infection complicated by organizing pneumonia. *Respirology case reports*, *4*(5).

Levy, P. S., & Lemeshow, S. (2013). *Sampling of populations: methods and applications*. John Wiley & Sons.
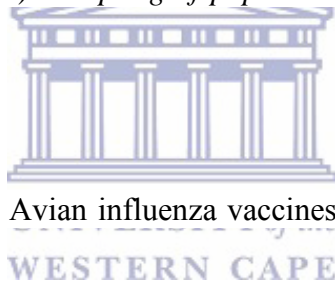
Li, C., Bu, Z., & Chen, H. (2014). Avian influenza vaccines against H5N1 'bird flu'. *Trends in biotechnology*, *32*(3), 147-156.

Louie, J. K., Acosta, M., Jamieson, D. J., & Honein, M. A. (2010). Severe 2009 H1N1 influenza in pregnant and postpartum women in California. *New England Journal of Medicine*, *362*(1), 27-35.

Lu, P. J., O'Halloran, A., Williams, W. W., Lindley, M. C., Farrall, S., & Bridges, C. B. (2015). Racial and ethnic disparities in vaccination coverage among adult populations in the US. *American journal of preventive medicine*, *49*(6), S412-S425.

MacKenzie, D. (2009). Swine flu: fact versus fantasy. *New Scientist*, *204*(2732), 40-45.

Marianna, M. (2011). What are the major ethical issues in conducting research? Is there a conflict between the research ethics and the nature of nursing? *Health Science Journal*, *5*(1).

Marentette, T. (2011). Exploring Predictors of Influenza Vaccination Among Hospital Based Nurses.

May, L., Katz, R., Johnston, L., Sanza, M., & Petinaux, B. (2010). Assessing physicians' in training attitudes and behaviors during the 2009 H1N1 influenza season: a cross- sectional survey of medical students and residents in an urban academic setting. *Influenza and other respiratory viruses*, *4*(5), 267-275.
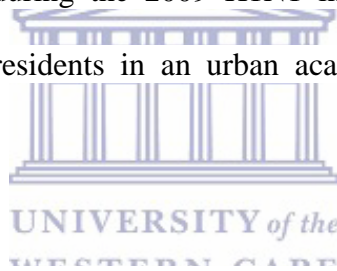
McAnerney, J. M., Cohen, C., Moyes, J., Besselaar, T. G., Buys, A., Schoub, B. D., & Blumberg, L. (2012). Twenty-five years of outpatient influenza surveillance in South Africa, 1984–2008. *The Journal of infectious diseases*, *206*(suppl_1), S153-S158.

McNab, C. (2009). What social media offers to health professionals and citizens. *Bulletin of the world health organization*, *87*(8), 566-566.

Meng, H., Liao, Q., Suen, L. K. P., O'Donoghue, M., Wong, C. M., & Yang, L. (2016). Healthcare seeking behavior of patients with influenza like illness: comparison of the summer and winter influenza epidemics. BMC Infectious Diseases, 16,

499.http://doi.org/10.1186/s12879-016-1821-7**.**

Miller, R.R., Markewitz, B.A., Rolfs, R.T., Brown, S.M., Dascomb, K.K., Grissom, C.K., Friedrichs, M.D., Mayer, J., Hirshberg, E.L., Conklin, J., & Paine, R. (2010). Clinical findings and demographic factors associated with ICU admission in Utah due to novel 2009 influenza A (H1N1) infection. *CHEST Journal*, *137*(4), 752-758.

Mo, P. K. H., & Lau, J. T. F. (2015). Influenza vaccination uptake and associated factors among elderly population in Hong Kong: the application of the Health Belief Model. *Health education research*, *30*(5), 706-718

Moule, P., & Goodman, M. (2009). Research in nursing. Nursing Research: An Introduction.

Murray, J., Cohen, A., Walaza, S., Groome, M., Madhi, S., Variava, E., Kahn K., Dawood H., Tempia S., Tshangela A. & Venter, M. (2015). Determining the provincial and national burden of influenza-associated severe acute respiratory illness in South Africa using a rapid assessment methodology. *PloS one*, *10*(7), e0132078.

Nair, H., Brooks, W.A., Katz, M., Roca, A., Berkley, J.A., Madhi, S.A., Simmerman, J.M., Gordon, A., Sato, M., Howie, S. and Krishnan, A. (2011). Global burden of respiratory infections due to seasonal influenza in young children: a systematic review and meta-analysis. *The Lancet*, *378*(9807), 1917-1930.

Najimi, A., & Golshiri, P. (2013). Knowledge, beliefs and preventive behaviors regarding Influenza A in students: a test of the health belief model. *Journal of education and health promotion*, *2*.

National Health Interview Survey (2009). Vaccination Coverage. Retrieved June 20, 2011 from http://www.cdc.gov/vaccines/stats-surv/nhis/downloads/2009-nhis-tables.xls.Neuzil, K. M., Reed, G. W., Mitchel, E. F., Simonsen, L., & Griffin, M. R. (1998). Impact of influenza on acute cardiopulmonary hospitalizations in pregnant women. *American journal of epidemiology*, *148*(11), 1094-1102.

Nishiura, H., & Inaba, H. (2011). Estimation of the incubation period of influenza A (H1N1-2009) among imported cases: addressing censoring using outbreak data at the origin of importation. *Journal of Theoretical Biology*, *272*(1), 123-130.
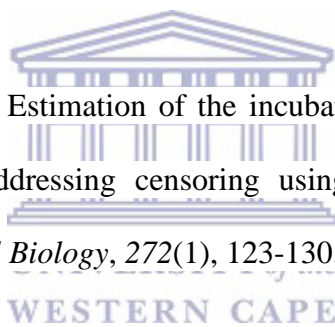
Nitsch-Osuch, A., & Brydak, L. B. (2014). Influenza viruses resistant to neuraminidase inhibitors. *Acta Biochim Pol*, *61*(3), 505-508.

Noble, H., & Smith, J. (2015). Issues of validity and reliability in qualitative research. *Evidence-Based Nursing*, ebnurs-2015.

Nyhan, B., & Reifler, J. (2015). Does correcting myths about the flu vaccine work? An experimental evaluation of the effects of corrective information. *Vaccine*, *33*(3), 459-464.

Omair, A. (2015). Selecting the appropriate study design for your research: Descriptive study designs. *Journal of Health Specialties*, *3*(3), 153.

Oshitani, H., Kamigaki, T., & Suzuki, A. (2008). Major issues and challenges of influenza pandemic preparedness in developing countries. *Emerging infectious diseases*, *14*(6), 875.

Ottenberg, A. L., Wu, J. T., Poland, G. A., Jacobson, R. M., Koenig, B. A., & Tilburt, J. C. (2011). Vaccinating Health Care Workers Against Influenza: The Ethical and Legal Rationale for a Mandate. *American Journal of Public Health, 101*(2), http://doi.org/10.2105/AJPH.2009.190751.
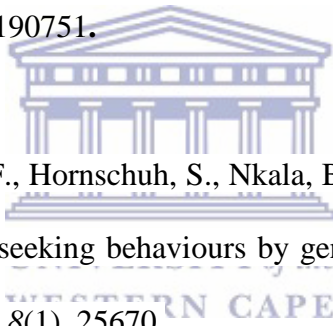
Otwombe, K., Dietrich, J., Laher, F., Hornschuh, S., Nkala, B., Chimoyi, L., Kaida, A., Gray, G. E. & Miller, C. L. (2015). Health-seeking behaviours by gender among adolescents in Soweto, South Africa. *Global health action*, *8*(1), 25670.

Pflug, A., Guilligay, D., Reich, S., & Cusack, S. (2014). Structure of influenza A polymerase bound to the viral RNA promoter. *Nature*, *516*(7531), 355.

Phrasisombath, K. (2009). Sample size and sampling methods. *Faculty of Postgraduate Studies and Research University of Health Sciences: Vientiane*.

Polit, D., & Beck, C. (2012). Essentials of nursing research. *Ethics*, *23*(2).

Potter, J., Stott, D. J., Roberts, M. A., Elder, A. G., O'donnell, B., Knight, P. V., & Carman, W. F. (1997). Influenza vaccination of health care workers in long-term-care hospitals reduces the mortality of elderly patients. *Journal of Infectious Diseases*, *175*(1), 1-6.

Punpanich, W., & Chotpitayasunondh, T. (2012). A review on the clinical spectrum and natural history of human influenza. *International Journal of Infectious Diseases*, *16*(10), e714-e723.

Qi, X., Qian, Y.H., Bao, C.J., Guo, X.L., Cui, L.B., Tang, F.Y., Ji, H., Huang, Y., Cai, P.Q., Lu, B., & Xu, K. (2013). Probable person to person transmission of novel avian influenza A (H7N9) virus in Eastern China, 2013: epidemiological investigation. *Bmj*, *347*, f4752.

Raj, A. (2016). A review on corrective action and preventive action (CAPA). *African Journal of Pharmacy and Pharmacology, 10*(1), 1-6.
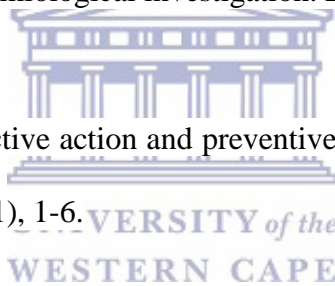
Rajasekar, S., Philominathan, P., & Chinnathambi, V. (2013) Research methodology**.**

Regan, A. K., Tracey, L., & Gibbs, R. (2015). Post-marketing surveillance of adverse events following immunization with inactivated quadrivalent and trivalent influenza vaccine in health care providers in Western Australia. *Vaccine*, *33*(46), 6149-6151.

Reperant, L. A., Rimmelzwaan, G. F., & Osterhaus, A. D. (2014). Advances in influenza vaccination. *F1000prime reports*, *6*.

Rowley, J. (2014). Designing and using research questionnaires. *Management Research Review*, *37*(3), 308-330.

Russell, C.A., Jones, T.C., Barr, I.G., Cox, N.J., Garten, R.J., Gregory, V., Gust, I.D., Hampson, A.W., Hay, A.J., Hurt, A.C. and de Jong, J.C. (2008). Influenza vaccine strain selection and recent studies on the global migration of seasonal influenza viruses. *Vaccine*, *26*, D31-D34.

Rybicki, E. (2015). Influenza Virus.

Saglanmak, N., Andreasen, V., Simonsen, L., Mølbak, K., Miller, M. A., & Viboud, C. (2011). Gradual changes in the age distribution of excess deaths in the years following the 1918 influenza pandemic in Copenhagen: using epidemiological evidence to detect antigenic drift. *Vaccine*, *29*, B42-B48.
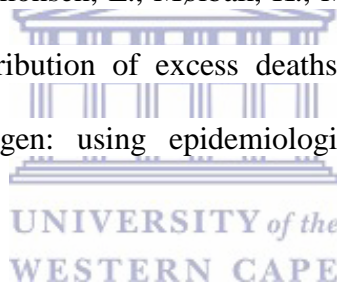
Saha, S., Chadha, M., Al Mamun, A., Rahman, M., Sturm-Ramirez, K., Chittaganpitch, M., Pattamadilok, S., Olsen, S.J., Sampurno, O.D., Setiawaty, V., & Pangesti, K. N. A. (2014). Influenza seasonality and vaccination timing in tropical and subtropical areas of southern and south-eastern Asia. *Bulletin of the World Health Organization*, *92*(5), 318-330.

Salaria, N. (2012). Meaning of the term descriptive survey research method. *International journal of transformations in business management*, *1*(6), 161-175.

Samson, M., Pizzorno, A., Abed, Y., & Boivin, G. (2013). Influenza virus resistance to

neuraminidase inhibitors. *Antiviral research*, *98*(2), 174-185.

Schlaudecker, E. P., McNeal, M. M., Dodd, C. N., Ranz, J. B., & Steinhoff, M. C. (2012). Pregnancy modifies the antibody response to trivalent influenza immunization. *The Journal of infectious diseases*, *206*(11), 1670-1673.

Shah, N. (2011). Ethical issues in biomedical research and publication. *Journal of conservative dentistry: JCD*, *14*(3), 205.

Shahrabani, S., Benzion, U., & Din, G. Y. (2009). Factors affecting nurses' decision to get the flu vaccine. *The European Journal of Health Economics*, *10*(2), 227-231.
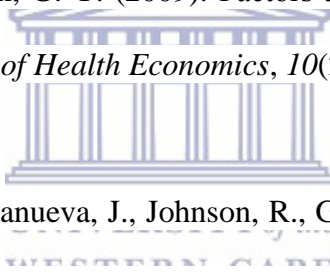
Shu, B., Wu, K.H., Emery, S., Villanueva, J., Johnson, R., Guthrie, E., Berman, L., Warnes, C., Barnes, N., Klimov, A. and Lindstrom, S. (2011). Design and performance of the CDC real-time reverse transcriptase PCR swine flu panel for detection of 2009 A (H1N1) pandemic influenza virus. *Journal of clinical microbiology*, *49*(7), 2614-2619.

Singh, S., Kaur, P., & Singh, G. (2013). Study to assess the awareness, perception and myths regarding swine flu among educated common public in Patiala District. *Int J Res Dev Health*, *12*, 54-60.

Talbot, T. R., Bradley, S. F., Cosgrove, S. E., Ruef, C., Siegel, J. D., & Weber, D. J. (2005). Influenza vaccination of healthcare workers and vaccine allocation for healthcare workers during

vaccine shortages. *Infection Control & Hospital Epidemiology*, *26*(11), 882-890.

Tanz, R. R. (2017). SECTION 1 Respiratory Disorders. *Nelson Pediatric Symptom-Based Diagnosis E-Book*, 1.

Tapia, E. D. L. N., Tinoco, Y. O., Carcamo, C., Azziz-Baumgartner, E., & Montgomery, J. M. (2014). Healthcare seeking behavior in Individuals with Influenza-like Illness (ILI) during the influenza pandemic of 2009 compared to posterior years in Peru. *International Journal of Infectious Diseases*, *21*, 215.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education*, *2*, 53.

Teitler-Regev, S., Shahrabani, S., & Benzion, U. (2011). Factors affecting intention among students to be vaccinated against A/H1N1 influenza: a health belief model approach. *Advances in preventive medicine*, *2011*.

Tosh, P. K., Boyce, T. G., & Poland, G. A. (2008, January). Flu myths: dispelling the myths associated with live attenuated influenza vaccine. In *Mayo Clinic Proceedings* (Vol. 83, No. 1, pp. 77-84). Elsevier.

Van Cauteren, D., Vaux, S., de Valk, H., Le Strat, Y., Vaillant, V., & Lévy-Bruhl, D. (2012). Burden of influenza, healthcare seeking behaviour and hygiene measures during the A (H1N1)

2009 pandemic in France: a population-based study. *BMC public health*, *12*(1), 947.

Van Kerkhove, M.D., Vandemaele, K.A., Shinde, V., Jaramillo-Gutierrez, G., Koukounari, A., Donnelly, C.A., Carlino, L.O., Owen, R., Paterson, B., Pelletier, L. and Vachon, J., (2011). Risk factors for severe outcomes following 2009 influenza A (H1N1) infection: a global pooled analysis. *PLoS medicine*, *8*(7), e1001053.

Walaza, S., & Cohen, C. (2016). Recommendations pertaining to the use of influenza vaccines and influenza antiviral drugs, 2016. *South African Medical Journal*, *106*(3), 251-253.

Wallace, L. (2015). Acceptance and Uptake of Influenza Vaccination by Health Care Workers (Doctoral dissertation, Walden University).
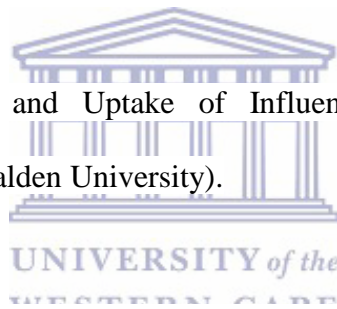
Wang, L. C., Hsu, W. E., Thong, W., Chao, T. Y., & Wang, C. H. (2017). Low specificity of a nested reverse transcription polymerase chain reaction to detect avian influenza virus nucleoprotein gene. *Taiwan Veterinary Journal*, *43*(02), 75-79.

World Health Organization [WHO] (2014). Influenza (seasonal) fact sheet. *http://www.who.int/en/news-room/fact-sheets/detail/influenza-(seasonal)*

WHO 2016 Influenza: Signs, symptoms and complications; Recommendations for prevention. http://www.euro.who.int/en/health-topics/communicable-diseases/influenza/publications/2012/influenza-signs,-symptoms-and-complications-

recommendations-for-prevention

Willis, B. C., & Wortley, P. (2007). Nurses' attitudes and beliefs about influenza and the influenza vaccine: a summary of focus groups in Alabama and Michigan. *American journal of infection control*, *35*(1), 20-24.

Wood, G., & Haber, J. (2006). Nursing research: Methods and critical appraisal for evidence-based practice. St. Louis, MO: Mosby. Inc. Google Scholar.

World Health Organization. Global Influenza Programme. (2009). *Pandemic influenza preparedness and response: a WHO guidance document*. World Health Organization.

World Health Organization (2011). WHO global technical consultation: global standards and tools for influenza surveillance, Geneva, Switzerland, 8-10 March 2011.

World Health Organization. (2014). Global influenza surveillance and response system (GISRS). *Geneva: World Health Organization*.

World Health Organization. (2016). Recommended composition of influenza virus vaccines for use in the 2014–2015 northern hemisphere influenza season. Geneva: WHO, 2014.

World Health Organization. (2016). Regional Workshop on Implementation of the Pandemic Influenza Preparedness Framework in the South-East Asia Region, Report of the Meeting, Jakarta, Indonesia, 27-29 April 2015.

Wright P. F., Deatly A. M., Karron R. A., Belshe R. B., Shi J. R., Gruber W. C., Zhu, Y. and Randolph, V.B. (2007). Comparison of results of detection of rhinovirus by PCR and viral culture in human nasal wash specimens from subjects with and without clinical symptoms of respiratory illness. J. Clin. Microbiology. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1933022/

Zimmer, S. M., & Burke, D. S. (2009). Historical perspective—emergence of influenza A (H1N1) viruses. *New England Journal of Medicine*, *361*(3), 279-285.

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APPENDIX 1: THE QUESTIONNAIRE

UNIVERSITY OF THE WESTERN CAPE
FACULTY OF COMMUNITY AND HEALTH SCIENCES
SCHOOL OF NURSING

QUESTIONNAIRE

Title: The perceptions, attitudes and health seeking behavior of nursing students at a university in the Western Cape regarding influenza

The questionnaire is structured in four sections. Please tick the appropriate response for each question.

Section A: **Biographical information**

1. Age	
15 to 20 years	
21 to 25 years	
26 to 30 years	
Over 30 years	

2. Sex	
Male	
Female	

3. Location	
On campus	
Off campus	

3.a. if off campus, where	
Northern Suburbs	
Cape Bowl	
Southern Suburbs	
Atlantic Seaboard	
Other	

4. Student level	
Foundations 1	
Foundations 2	
B Nursing 1	
B Nursing 2	
B Nursing 3	
B Nursing 4	

5. Marital Status	
Single	
Married (divorced, widowed, co-habitation)	

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6. Dependents	
0	
1	
2	
3	
More than 3	

7. Ethnicity	
Black	
White	
Colored	
Indian	

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8. Religion	
Christian	
Muslim	
Hindu	
Other	

9. Medical Aid	
Yes	
No	

Section B: Susceptibility to and Severity of the influenza virus

Please tick the response that most closely represents your perception about your Susceptibility to the influenza virus and Severity of the infection on a scale of 1 - 4.

Scale: (1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree

Questions	1	2	3	4
10. Contact with the multiple people each day increases my chances of contracting the flu				
11. Contract influenza has an impact on my job				
12. Flu is just like having a heavy cold				
13. Flu can be treated with antibiotics				
14. Once you have had the flu vaccine, you're protected for life				
15. Vaccination against influenza is a waste of time and money				
16. People with cardiac disease are more likely to contracting influenza				
17. People with chronic disease such as diabetes mellitus or asthma are more likely to contracting influenza				
18. People with Immunosuppression are at high risk of				

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influenza complications			
19. Difficulty breathing or shortness of breath due to contracting influenza needs to get medical help immediately			
20. runny or stuffy nose is a symptom of contracting influenza			
21. Contracting influenza may lead to other serious health problems			

Please tick yes or no to the response that most closely represents your perception about your Susceptibility to the influenza virus and Severity of the infection

22. The following people are at high risk for developing flu related complications. Tick which ever applies.	YES	NO
Children younger than five, but especially children younger than 2 years.		
Adults 65 years of age and older		
Pregnant women		
People who have medical conditions like asthma and heart disease		
Young adults 19 through 24 years of age that they often live, work and study in close proximity		

23. The Flu virus is more likely to spread during which season?		

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Tick which ever applies.	YES	NO
Summer		
Autumn		
Winter		
Spring		
Undecided		

24. The symptoms of Flu include the following. Tick which ever applies.	YES	NO
Fever		
Coughing		
Sore Throat		
Headache		
Runny or stuffy nose		

25. How is the Flu virus spread? Tick which ever applies.	YES	NO
Airborne respiratory droplets		
Coughing		
Sneezing		
Skin to skin contact		
Touching a contaminated surface		

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Section C: Benefits of influenza vaccination

Please tick the response that most closely represents your perception about the benefits of influenza vaccination related to preventative action for influenza on a scale of 1 - 4.
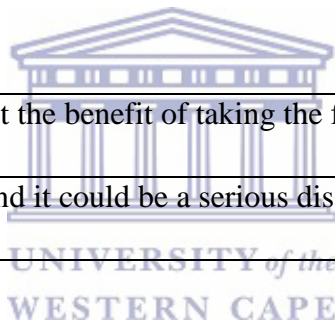
Scale: (1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree

Questions	1	2	3	4
26. Taking a flu vaccine will prevent me from contracting the flu virus				
27. Taking a flu vaccine will protect others in my household from contracting the flu virus				
28. Taking a flu vaccine will prevent me from being absent from studying and work				
29. Wash hands frequently can help prevent the spread of the flu				
30. Bed rest could relieve the symptoms of the influenza				
31. Avoiding closed places could protected me from contracting influenza				

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Section D: Barriers and Cues to action / Health seeking behaviour

Please tick Yes or No to the appropriate response that most closely represents your perception about your barriers and health seeking behaviours to the influenza virus

I took the flu vaccine after:	YES	NO
32. I read about the possible complication of contracting the flu		
33. I learnt in class about the benefits of the flu virus		
34. I learnt on social media about the benefit of taking the flu vaccine		
35. My friend or family told me about the benefit of taking the flu vaccine		
36. My doctor told me about the benefit of taking the flu vaccine		
37. I read about influenza and it could be a serious disease		

Please tick the response that most closely represents your perception about your barriers and health seeking behaviours to the influenza virus on a scale of 1 - 4.

Scale: (1) Strongly Disagree (2) Disagree (3) Agree (4) Strongly Agree

Questions	1	2	3	4
38. Taking a flu vaccine is not convenient for me.				
39. Taking a flu vaccine can be painful.				
40. Taking a flu vaccine is time consuming.				
41. Taking a flu vaccine interferes with my daily activities.				

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42. There are too many risks in taking a flu vaccine.				
43. It costs too much to take a flu vaccine				
44. I am concerned about having a bad reaction from the flu vaccine				

Please tick the appropriate response that most closely represents your perception about your health seeking behaviours to the influenza

45. When did you last contract the influenza (Flu)?	
0 – 6 months	
7 – 11 months	
12 – 24months	
More than 2 years	

THANK YOU FOR PARTICIPATING IN THIS STUDY

APPENDIX 2: ETHICS

OFFICE OF THE DIRECTOR: RESEARCH
RESEARCH AND INNOVATION DIVISION

UNIVERSITY of the WESTERN CAPE

24 October 2017

Mrs F Ramadan
School of Nursing
Faculty of Community and Health Sciences

Ethics Reference Number: HS17/9/7

Project Title: The perceptions, attitudes and health seeking behavior of nursing students at a university in the Western Cape regarding influenza.

Approval Period: 20 October 2017 – 20 October 2018

I hereby certify that the Humanities and Social Science Research Ethics Committee of the University of the Western Cape approved the methodology and ethics of the above mentioned research project.

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval. Please remember to submit a progress report in good time for annual renewal.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

PROVISIONAL REC NUMBER – 130416-049

FROM HOPE TO ACTION THROUGH KNOWLEDGE.

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APPENDIX 3: PERMISSION LETTER

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9599483 Fax: 27 21-959 2679
E-mail: 3500038@myuwc.ac.za

REQUEST FOR PERMISSION

I **Fatma Omar Ramadan** (3500038) a student registered for M Nursing at the University of the Western Cape requests permission to conduct a research study entitled "The perceptions, attitudes and health seeking behaviour of nursing students at a university in the Western Cape regarding influenza" at the School or Nursing.

My target population will be all undergraduate nursing student in the foundation and mainstream Bachelor of Nursing programme. This research project involves students completing a questionnaire which will take approximately 15 minutes. The questionnaires will be stored in a locked drawer and only the researcher and the supervisor will have to the questionnaires. To ensure anonymity, personal information of research subjects will be kept confidential to the researcher only.

Thanking you,

Signature of Researcher:

Date: 1 October 2017

Permission Granted:……………………………………….

Director School of Nursing

Date: 6 November 2017

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APPENDIX 4: INFORMATION SHEET

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9599483 Fax: 27 21-959 2679
E-mail: 3500038@myuwc.ac.za

INFORMATION SHEET

Project Title: The perceptions, attitudes and health seeking behaviour of nursing students at a university in the Western Cape regarding influenza

What is this study about?
This is a research project being conducted by Fatma Omar Ramadan at the University of the Western Cape. We are inviting you, as a nursing student, to participate in this research project because it focuses on nursing students' perceptions, attitudes and health seeking behaviour regarding influenza.

What will I be asked to do if I agree to participate?
You will be asked to complete a questionnaire which is written in simple English language. It will take a maximum of 15 minutes to complete the questionnaire. The questionnaires will be completed on a date and time that suits the students which will be arranged with your lecturer. The questionnaire focuses on your perceptions about your susceptibility to the influenza virus, whether or not you take the influenza vaccine and what are the barriers to taking the influenza vaccine.

Would my participation in this study be kept confidential?
The researcher undertakes to protect your identity and the nature of your contribution in this study. To ensure your anonymity, the names of the participants will be omitted on the questionnaire and their identity will be protected during data analysis by using codes. Only the researcher will have access to identification key which only relates to your current year of study. The results of this study will be published without mentioning the names of the participants and the institution where the study was conducted. To ensure your confidentiality, completed questionnaires will be kept secure in a locked drawer to which only the researcher has access.

What are the risks of this research?
All human interactions and talking about self or others carry some amount of risks. We will nevertheless minimise such risks and act promptly to assist you if you experience any discomfort, psychological or

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otherwise during the process of your participation in this study. Where necessary, an appropriate referral will be made to a suitable professional for further assistance or intervention.

What are the benefits of this research?
The results of this research may help the investigator learn more about nursing student's perceptions, attitudes and health seeking behaviour regarding influenza, which will be used to guide the implementation of appropriate health promotion efforts amongst nursing students.

Do I have to be in this research and may I stop participating at any time?
Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

What if I have questions?
This research is being conducted by Fatma O. Ramadan, a Master's in Nursing student at the University of the Western Cape. If you have any questions about the research study itself, please contact Fatma O. Ramada: Cell no 0745212880; e-mail address: 3500038@myuwc.ac.za
Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Prof/ J. Chipps
Head of Department: e.g. School of Nursing
University of the Western Cape
Private Bag X17
Bellville 7535
jchipps@uwc.ac.za
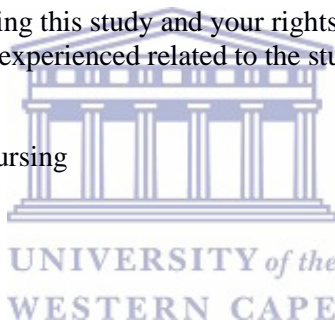
Prof Anthea Rhoda
Dean of the Faculty of Community and Health Sciences
University of the Western Cape
Private Bag X17
Bellville 7535
chs-deansoffice@uwc.ac.za

This research has been approved by the University of the Western Cape's Humanities and Social Sciences Research Ethics Committee)
REFERENCE NUMBER: HS 17/9/7
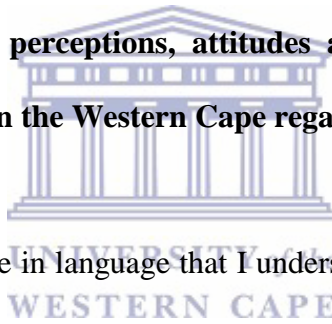
APPENDIX 5: CONSENT FORM

UNIVERSITY OF THE WESTERN CAPE
Private Bag X 17, Bellville 7535, South Africa
Cell no : 0745212880
E-mail: 3500038@myuwc.ac.za

CONSENT FORM

Title of Research Project: The perceptions, attitudes and health seeking behaviour of nursing students at a university in the Western Cape regarding influenza

The study has been described to me in language that I understand. My questions about the study have been answered. I understand what my participation will involve and I agree to participate of my own choice and free will. I understand that my identity will not be disclosed to anyone. I understand that I may withdraw from the study at any time without giving a reason and without fear of negative consequences or loss of benefits.

Participant's name………………………..

Participant's signature……………………

Date………………………