Comparing the Job Location Choices of University-trained and College-trained Professional Nurses in South Africa

Debrah Vambe

Student Number: 882282

Supervisors: Dr Duane Blaauw
                  Dr Prudence Ditlopo

A research report submitted to the School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Public Health in the field of Health Systems and Policy

08 November, 2018

Johannesburg, South Africa

DECLARATION

I, Debrah Vambe, hereby declare that this research report is my own work except as indicated in the references and acknowledgements. I am submitting it in partial fulfilment of the Master of Public Health degree in the field of Health Systems and Policy in the School of Public Health at the University of the Witwatersrand, Johannesburg. I can further confirm that this work has not been submitted for any other degree at this or any other University.

Full Name: Debrah Vambe

Signature:

Signed at: Witwatersrand School of Public Health

On the 08th day of November 2018

DEDICATION

This research report is dedicated to my family especially my son, Nyakallang Kupakwashe Moyo for their support. I would want to appreciate their understanding when I was away from home from 2014 and when I was busy with my research report in 2016 and 2017. To my son Kupakwashe, I would want to admit that those days were not easy when you wanted to play with your mother and she also had to attend to her school work.

ACKNOWLEDGEMENTS

ABSTRACT

Background

In South Africa, university-trained professional nurses attain a degree after 4 years of training and college-trained professional nurses attain a diploma after 4 years of training. The competence of degree versus diploma nurses has been debated for a number of years. It is argued that degree programmes provide students with critical thinking skills, leadership and management, and a more in-depth study of the physical and social sciences, as well as community and public health nursing. There is also inconclusive evidence suggesting that university-trained nurses are more competent than college-trained nurses in certain areas. This has led to a shift towards university-trained nurses in many countries with the intention of improving patient safety and quality of care. The debates have mainly focused on the relative nursing skills of these two training routes, but there is limited evidence on the retention and job location choices of university-trained and college-trained professional nurses for different sectors (public or private), areas (rural or urban), or facility types (hospital, clinic/community health centre (CHC). Hence this study was conducted to compare the job location choices of college-trained and university-trained professional nurses, as well as the factors associated with these choices over time as well.

Methodology

This study was a secondary analysis of data from a prospective cohort study of South African college and university professional nursing graduates from two provinces in 2009 up to 2015. Job location choices, defined as working in the public or private sector; rural or urban area; and hospital, clinic/community health centre (CHC) or other facilities were the primary outcomes for this study. The main exposure variable was the training institution type which was defined as either university or college-training. Job location choices of these university-trained and college-trained professional nurses was assessed after 6 years of follow-up using Pearson's chi-squared test followed by binary and multinomial logistic regression to adjust for confounders. Information on potential predictors of job location choices other than training institution type were assessed using Pearson's chi-squared test and t-tests. All professional nursing graduates started in the public sector for

community service, so we also evaluated the time to first move to the private sector during the period 2009-2015 using survival analysis. Kaplan-Meier curves were used to compare this outcome between university and college-trained nurses. A Cox proportional hazard model was used to determine the possible association of predictor variables and to obtain adjusted hazard ratios. Data were analysed using Stata version 14.0.

Results

The results show that type of sector (public, private for-profit and private not-for-profit) was the only job location choice associated with training institution type after 6 years of follow up (p=0.019), with more college-trained professional nurses in the public sector (78.3%) as compared to university-trained nurses (62.5%). Work area (urban or rural) and facility type (clinic/community health centre, hospital or other), were not associated with training institution type, (p=0.179) and (p=0.459) respectively. When adjusted for confounders, training institution type was found not to be significantly associated with any job location choice including type of sector. Instead being male (OR=2.57; 95%CI=1.11-5.44), being white (OR=7.70; 95%CI:2.02-29.36), under 30 years (OR=2.30; 95%CI:1.10-4.89), having a child (OR=0.46; 95%CI:0.23-0.91) and having nursing as first career choice (OR=0.47; 95%CI=0.22-0.99) were strong predictors of choosing private sector job location as compared to public sector.

In the survival analysis, the proportion leaving the public sector at any given time was higher and earlier among university-trained compared to college-trained professional nurses (p=0.010). When adjusted for confounders, change from public to private sector was found not to be significantly associated with training institution type but age below 30 years (HR=2.21; 95%CI:1.35-3.62), being white (HR=3.16; 95%CI:1.64-6.03) and nursing as first career choice (HR=0.56; 95%CI:0.36-0.89) were strong predictors for moving to the private sector.

The top 3 reasons for job location changes from public to private, rural to urban and clinic/CHC to hospital were job dissatisfaction (64.1%), wanting to be closer home (46.8%) and wanting to earn higher salary (33.7%). The main reasons for movement from public to private sector alone were job dissatisfaction (27.3%), wanting to earn higher salary (19.5%) and advancement in career/wanting new challenge (12.7%).

Implications, Recommendations and Conclusions

The study found some association between sector (private or public) and training institution type of professional nurses on bivariate analysis. On multivariate analysis, the association was no statistically significant but certain sociodemographic factors such as gender, age, having children, ethnicity and choosing nursing as first career choice were stronger predictors of job location choice. This analysis suggests that retention of degree-trained nurses in the public sector or rural areas is not significantly different to that of diploma-trained nurses, although larger studies from a wider range of training institutions are required to confirm this.

This study provides useful evidence for policy makers involved in the reform of nursing education in South Africa in order improve nursing skills and health care service quality, particularly in underserved communities. The South African government could therefore consider implementing the nursing education reforms and promoting primary health care re-engineering since these cadres have almost similar job location choices.

Contents

List of Tables

List of Figures

CHAPTER 1: BACKGROUND AND LITERATURE REVIEW

1.0 Background

Globally, there is increasing emphasis on the need for equitable human resources for health to achieve the universal health coverage (UHC) (1,2). The aim of the UHC is to ensure that everyone receives quality health services they need without suffering any financial hardship, whether they are from rural or urban areas or using private or public sectors (1,3,4). South African government is also in the process of reforming its entire health care system by implementing a system known as National Health Insurance(NHI) to ensure universal health coverage (5,6). This system plans to address the shortcomings and disparities in the current public and private healthcare sectors which include access to well-equipped health facilities and skilled health workforce (5,6).

Over the years, efforts have been made to generate evidence that could assist countries in ensuring that sufficient health workforce with the right skill mix is available and equally distributed across sectors (rural, urban, private, public sector) and levels of care (clinics or hospitals) (6–8). These factors have long been recognised as holding back the full realisation of health-related 2000-2015 Millennium Development Goals (MDGs) (7,8). To this end, without a 'fit for purpose' workforce, countries are at risk of not only failing to meet the recently adopted 2016-2030 Sustainable Development Goals (SDGs) targets, but of even reversing progress in the face of population growth and unexpected new and re-emerging health challenges like Ebola and drug resistance tuberculosis and HIV (8,9).

There is an estimated shortage of more than 4 million health care workers globally and Sub-Saharan Africa is mostly affected (10,11). In 2010, the global average ratio for doctors to patients was at 1.4/1000 and nurses was at 2.8/1000 population (11). In sub-Saharan Africa (SSA), the ratio was 0.2 /1000 and 1.1/100 for doctors and nurses respectively (11,12). The ratio of nurses to population stood at 4.1/1000 in South Africa in 2015, which is higher than the global average of 2.8/1000 and that of other countries with similar levels of income such as China (1.0/1000), Brazil (2.9/1000), Turkey (1.9/1000) and Thailand (1.4/1000) (13). Although in 2010 South Africa spent about 8.6% of its gross domestic product (GDP) on health similar to the proportion spent by countries like Brazil, Spain, Italy and England (12), this

investment has not translated into improved health outcomes such as under-five mortality rate and others (14,15).

Globally, nurses constitute a larger proportion of the human resources for health and they are at the forefront of health care delivery (10). However, their contribution is hindered by imbalances in skill mix and inequities in geographical distribution between sectors and levels of care (10,16–18). Such disparities may further be exacerbated by insufficient preparation and training of nurses to work in the underserved areas such as rural areas, the public sectors and primary health care clinics (19). The low- and middle-income countries (LMIC) seem to experience most of these disparities unlike high-income countries who are able to bring in foreigners with similar experience to work in these underserved areas (17,18,20). There is therefore a need to come up with strategies which address the equitable distribution of professional nurses in various job locations and also to enhance their performance. The current nursing education reforms are also promoting degree qualified professional nurses as opposed to diploma nurses due to the changes in disease profiles which are more complex and requires more critical thinking (6,21– 24). The global shift towards more promotive and preventative services also means that there is need for more effort at primary health care level/clinics. South Africa initiated primary health care re-engineering with the aim to improve the quality of services in the public sector clinics by ensuring availability of skilled professional nurses in these job locations (15,25).

The profile of the South African nursing profession has changed over the years (26). The profession remains largely female, although numbers of males are increasing in certain contexts (26). About 60% of nurses, most of them African, work in the public sector, where they serve about 85% of the population (27). The profession has high attrition levels between enrolment at a training institution and graduation, as well as between graduation and registration(26,27). Of note, there has been slight changes in the ageing nursing workforce of the registered nurses over the years. In 2008, 42

% of the registered nurses were above 50 years, in 2015 they were around 49% and recently in 2018 about 48% were above 50 years (26,27).

In South Africa there are different nursing cadres which include, auxillary nurse, enrolled nurse, staff nurse, registered professional nurse and registered specialist nurses (23,28). University-trained professional nurses attain a degree after 4 years of training and college-trained professional nurses attain a diploma after 4 years of training (23,28). Universities offer four-year, basic full-time undergraduate degree (Bcur) that prepares students in four career fields, namely general nursing (caring for people in hospitals, clinics and private practices); community nursing (primary healthcare and the prevention of disease in the community); psychiatric nursing (treating the mental health of individuals); and midwifery (23,28). Universities also offer post-basic qualifications after a 4 year diploma or degree, master's and doctoral degrees (23,28). Once students complete a Bcur degree (or equivalent) from university or a 4 year diploma from college, they are able to register as a professional nurse and midwife with the SANC (23,28). After Master's degree and PHD in nursing, they are registered as a specialist nurse. Auxillary nurses who attain a higher certificate after a year of training, enrolled nurse who attain a higher certificate after 2 years of training and staff nurse who attain a diploma after 3 years of training cannot register as professional nurses in South Africa (23,28).

This study will be focusing mainly on professional/registered nurses who either attained a 4-year degree or diploma in university or college respectively with the intention of providing some needed information on the job location choices of these professional nurses. This will assist the policy makers in making informed decisions on the ongoing nursing education reforms in South Africa.

1.1 Literature Review

1.1.1 Nurse-led primary health care (PHC) re-engineering

In line with the aspirations of UHC, the South African government prioritised PHC strengthening as a mechanism for improving the management and availability of quality health services in the public sector (29). PHC service delivery in South Africa is primarily government-funded with clinics that offer a comprehensive range of preventive, promotive and basic curative services that are free at the point of contact (19,25). In these clinics, professional nurses constitute the majority of the health

workforce and they are the gatekeepers of the PHC system (25,30,31). These professional nurses are either university-trained or college-trained who have acquired a degree or diploma respectively (30–32).

The direction of PHC re-engineering was further reinforced in 2011 when the government released the green paper on National Health Insurance, mainly looking at health system reforms towards universal health coverage (29). PHC is led by professional nurses who are supported by doctors and other categories of health professionals (19,29). Majority of the professional nurses working in the PHC system have a post-basic qualification in PHC (30–32). This becomes very imperative for South Africa to understand the job location choices of these professional nurses and see whether they will be interested in working in primary health care facilities which are usually clinics or public sectors. The training institution type, which is either university or college training plays a major role in equipping professional nurses with the right skills especially leadership roles (32). However, insufficient time is spent during leadership training.

Realising the important role that professional nurses play and the magnitude of the proportion of nurses as compared to other health care workers, South Africa along with other countries started thinking about implementing nursing education reforms which were aimed at enhancing nurses' performance, as one of the strategies to strengthen the health system hence improving the health outcomes (33).

1.1.2 Training of professional nurses to enhance their performance.
There have been some concerns in many countries about the decline of the status of professional nurses because of the many entry points which affected their expected performance and recognition by other professionals (22,31,34,35). One of the ways identified to enhance nurses' performance and recognition was to move towards university-trained/bachelor of nursing degree for all professional nurses (36,37). The American Association of Colleges of Nursing (AACN) has since endorsed the baccalaureate degree as the entry point to the nursing profession 1965 and in 2005 together with the American Organization of Nurse Executives and other authorities called for an increased production of baccalaureate degree professional nurses to meet the community demands (24,38). Some of the countries have already adopted

the degree entry point but others, especially in Africa are still at the different stages of adopting this nursing educational reform (22,24).

The United States of America has since adopted a 4-5 year baccalaureate degree as an entry point for registered professional nurses although 3 year diploma nurses are still recognised (35,38). To accelerate the process, New York State Nurses Association introduced a bill that would require registered diploma professional nurses to attain a baccalaureate degree in nursing within 10 years of their initial licensure (35). In the United Kingdom, the nursing diploma has been phased out in higher education and there are 4 recognised pre-registration 4-year nursing degrees which are in the field of adult, child (paediatric), learning disability and mental health and these are offered in universities(39). In Australia, the nursing education for professional nurses was since transferred from hospital-based to higher education sector in 1991 with absorption of colleges of advanced education into universities (40). The nursing levels have since been collapsed into two: a) the registered professional nurse with a 3-year degree or higher qualification from a university and b) enrolled nurse with a 1-2 year certificate or diploma from vocational educational institutions (39,40). In most African countries such as Uganda, Gambia, Kenya and Zimbabwe, there are generally 2 levels of registered professional nurses which are: a) diploma nurses who are trained in colleges for 3 years and are awarded a diploma certificate upon completion, and b) degree nurses who are trained at the university for four years and attain a degree certificate upon completion (41–44).

South Africa commenced the nursing education in 1899 and it was the first country in the world to regulate and register its nurses. Since then several programs have evolved due to the needs of the health system and the patients. The first nursing degree programme was started at the University of Pretoria in 1955 and before 1994, nursing programmes were divided into pre- and post-registration programmes (28,31). In an attempt to align with the global trend of phasing out college-trained professional nurses in favour of university-trained ones (22,36,37,45,46), the South African government started the process of revising the nursing qualifications framework which was in two phases. The first phase of the reform process occurred between 2004 and 2009 and was primarily concerned with aligning existing nursing qualifications with the Nursing Qualifications Framework (NQF). These were the so-called legacy qualifications inherited in 1994 for the training of enrolled nursing

auxiliaries (1-year training), enrolled nurses (2 years of training), and diploma or degree-qualified professional nurses with 4 years of training.

The second phase of the reform from 2008 to 2013 dealt with the development of a completely new Nursing Qualifications Framework, also aligned with the HEQF which was meant to be led by SANC. Timeframes were not adhered to, and despite an initial deadline of 30 June 2010 being set for the phasing out of the legacy qualifications, the process has continually been extended. The new deadline, at the time of Blaauw et al article was set for 30 June 2015 (23). These changes were in cognisance of the need for improving the scope of practice for nurses arising from the changing disease profiles including the rise in HIV/AIDS and TB cases in the country (14,47). These reforms proposed three major changes to the nursing qualifications framework (23). Firstly, the requirement of a 4-year baccalaureate degree at a university for registration of a professional nurse and phasing out of college-trained professional nurses (23). Secondly, the elimination of a 2-year enrolled nurse in favour of a 3-year diploma nurse who will be registered as a staff nurse and will be responsible for basic nursing care and thirdly the removal of the bridging course resulting in only one pathway to becoming a professional nurse instead of three (23,28).

These reforms have not yet been implemented, hence the outcomes are yet to be determined. The delays have been due to many layers of approval required by the South African system. There has also been calls for baseline studies to be conducted to evaluate the implementation of the changes and the effect they will have within the health system (28). This study will also contribute knowledge to debates on the implications of the proposed changes.

While some high-income countries have already moved away from college-trained to university-trained nurses (29,31,48), some African countries including South Africa has kept registration of both university-trained and college-trained nurses as professional nurses (36). This has been mainly because the two levels of education seem to complement each other in their strengths and weaknesses in that college-trained nurses are trained on the job and are said to have more experience in clinical skills and bed-side care compared to university-trained nurses who are more skilled in leadership and their ability to solve complex situations (21,27,49–52). A survey

done in Canada confirmed these findings by emphasising the need to have professional nurses holding these two levels of nursing education (50). Another lesson learnt from this Canadian study was that as countries phase out college-trained nurses, they should also be promoting primary health care with more promotive and preventative services, which are being emphasized in the curriculum of the university-trained nurses (50).

There has been a shift in training and employment patterns for nurses in South Africa between the period 1997 and 2007 (26,53). This is the time when the health system was attempting to reduce the inequalities in access to care inherited from the apartheid era where the rich had better access to good health facilities (26,47). The nurses were supposed to be trained in line with the primary-healthcare needs. There was then an increase in nurses' training but unfortunately the output of the registered nurses at SANC did not reflect this improvement (26), instead the number of enrolled and auxillary nurses doubled by 2007 with a decline in the numbers of professional nurses (27). The college-trained professional nurses reduced from 62% to 37% and university-trained nurses increased from 10% to 16% but was still low (27). There was then need for public nursing colleges and universities to train more professional nurses (26).

1.1.3. Comparing university-trained and college-trained professional nurses

A number of studies have argued that university training/baccalaureate education enhanced the knowledge, ethical reasoning and critical thinking skills of nurses and that this has positive impact on patient outcomes (36,37,54–57). It is believed that university training equip the nurses to deal with more complex conditions given the changes in disease profiles (36,37). The general view is that education rather than experience influences patient outcomes (55–60).

For example, one study demonstrated that having more nurses who are university-trained with baccalaureate degree (60% versus 20%) would reduce surgical patient mortality by 3.6 deaths per 1,000 and those with complications by 14.2 deaths per 1,000 (58). Other studies reported that a 10% increase in university-trained degree nurses at facility level was associated with a 5% decrease in 30-day mortality rates (57,58). However, it was noted that multiple factors may have influenced these outcomes (57,58). Another study also reported that educational preparation for

university-trained surgical nurses is associated with better patient outcomes (59). This has also a bearing in employment preferences for example a survey done with chief nursing officers who are members of the University Health System Consortium Chief Nursing Officer Council in America in 2001 noted that their preference for hiring would be baccalaureate-prepared nurses because of what they had observed over the years in terms of competence and skills (61). They perceived baccalaureate-prepared nurses to be less task-oriented than diploma nurses, having more professional behaviors, stronger leadership skills, more focused on continuity of care and outcomes and greater communication skills (61).

A degree programme or university-training is believed to prepare graduates with a higher level of competence than their diploma or college-trained counterparts (45). However, there have been inconsistent findings reported as to whether or not university-trained nurses outperformed college-trained nurses (37,50,62). For instance, a 2014 longitudinal study of 122 nursing graduates done in five hospitals in Japan compared graduates' perceptions of competence development in their first year of employment between university-trained and college-trained nurses (46). The self-assessed competence questionnaires were collected at months 3,6,9 and 12 (46). The results of this study showed that the college-trained nurses rated their competence levels as higher than the university-trained nurses but that the university-trained nurse's perceptions of their competence increased with time (46). Possible explanation was that the timing of the assessment could have contributed to such results because there is more emphasis on theoretical and intellectual components than practical for university-trained nurses (46).

Critical thinking skills, confidence, maturity, and open-mindedness has been observed to increase significantly with each year of schooling for nurses. If many nursing students complete their baccalaureate degree there would be a change in the characteristics of the nursing workforce (37,54,62). This therefore emphasises the need for balancing the theoretical and practical components in the established university curriculums (46).

In cognisance of the fact that more emphasis is on the university-trained nurses, it becomes important to understand in more detail factors influencing the job location

choices of university-trained and college-trained nurses in South Africa in order to inform the nursing education policy reform in the country.

1.1.4 Factors associated with the job location choices and retention of professional nurses

Some studies have highlighted that job location choices and retention of health workers can be influenced by individual, organisational, institutional structures/factors, sociocultural environment, health care and educational systems related factors (48,63–67).

The individual factors can include sociodemographic characteristics such as social background, age, gender, ethnicity, marital status, education level, values and beliefs (48,63,64,67). It has been noted that younger individuals who have no family responsibilities are more likely to move from one place to the other (64). Single women are less likely to work in rural areas and when married they prefer working in the same job locations as their spouses (64). Those who grew up in the rural areas have been seen to be more likely to accept posts in the rural facilities (64). The decision to move to a certain location in some instances has been seen to be influenced by an individual's expectations and career advancement (64). For those who are married and have children, their job location choices are influenced by availability of good schools and job opportunities for their spouses (64).

Most recently, a cross-sectional descriptive study done in South Africa aimed at establishing whether degree-prepared nurses utilised scholarships more often than diploma-prepared nurses showed that the majority of the university-trained nurses utilised scholarships more than college-trained nurses (68). The data revealed some differences in sociodemographic characteristics of these 2 cadres with the majority of the degree nurses being whites (64,5%) while most diploma nurses were blacks (59.45%). Sixty-eight percent of the diploma nurses were still in the public sector compared to 51% of the degree nurses while 48% were in the private sector (68). The age range of all the participants was 26-54 years with a median of 40 years and the younger age group was among the degree nurses (68).

Understanding the type of students who choose to do nursing as their career of choice is also important to provide evidence for retention and recruitment policies. A study conducted in Korea examined the characteristics of nursing students and

factors influencing their career choice compared to the non-nursing students (69). Public databases of the Korean Education & Employment Panel which has longitudinal data for 4000 high school students in their final year of school were used (69). Out of those students, 2456 students entered a non-nursing college or university and 40 students (39 females and one male) entered nursing university. Nursing students were compared with 1011 female non-nursing students (69) and the results showed that nursing students had lower household income, better high school academic achievements especially science, more studious attitude and lower absenteeism (69). Factors influencing career choice among nursing students were employability (55%) followed by aptitude (20%) (69). About half of nursing students mentioned that they were the most influential person in choosing nursing compared to three quarters of non-nursing students. Nursing students had a higher rate (75%) of satisfaction with their degree qualification than non-nursing students (60%) (69).

After experiencing distributional inequities of nurses, a cross-sectional survey study was conducted in Mainland China to understand the mobility patterns of the nursing workforce and factors influencing their job location choices (70). A total of 512 university-trained (degree) and college-trained (diploma) nurses who were working in both medical and surgical wards participated in the study (70). The results showed that factors influencing movement of nurses included level of satisfaction with the working conditions in certain departments and clarity in the job descriptions of university-trained and college-trained nurses which also had a bearing in commitment to their work. Nurses with a diploma (college-trained) reported greater professional commitment and a lower level of role conflict than those with a bachelor degree (university-trained) ($p<0.05$), but there were no significant differences in job satisfaction, organisational commitment, occupational stress and role ambiguity by educational programme ($p>0.05$) (70). In conclusion, it was noted that hospital nurses' positive feelings regarding their working lives may be influenced by addressing working conditions and clearly defining roles in the nursing profession (70). Nurses' educational level was an influencing factor on nurses' views and experiences of their working lives with the findings suggesting the need to develop a clinical career ladder with specified job descriptions for both university-trained and college-trained nursing staff in Mainland China (70).

Organisational factors such as management style, incentives, salary scales, recruitment and retention practises has been seen to influence job location choices of nurses (64,71). Remuneration or salary scales seem to play a major role in choosing job locations with the majority of the nurses preferring urban areas and private sectors because of better salaries and opportunities for moonlighting (64,72). A cross-sectional survey done in South Africa in 2005 with a sample size of 143 also highlighted some of these issues which looked at relationships between demographic variables, job satisfaction and turnover intention among primary healthcare nurses in the rural areas (73). The findings showed that nurses were satisfied with work content and co-worker relationships but were dissatisfied with salaries and working conditions (73). Half of all nurses considered moving within two years, of whom three in ten considered moving overseas (73). Job satisfaction was statistically significantly associated with unit tenure ($P< 0.05$), professional rank ($P< 0.01$) and turnover intent ($P<0.01$) (73). Turnover intent meant intention/consideration to leave a certain job location and was quite significantly explained by job satisfaction, age and education ($P< 0.001$), with younger and higher educated nurses being more likely to show turnover intent (73). Satisfaction with supervision was the only facet significantly explaining turnover intent when controlling for age, education, years of nursing and unit tenure ($P < 0.001$) (73). The study concluded that strategies aimed at improving job satisfaction and retention of primary healthcare nurses in rural South Africa should rely not only on financial rewards and improved work conditions but also on adequate human resource management (73).

Other factors influencing the distribution in job locations of nurses when they start working include the enrolment profile in nursing colleges and universities, urban or rural background, and composition in terms of numbers, age and gender (64,74,75). Systematic reviews of literature highlighted some of the factors associated with geographical imbalances which included professional nurses wanting to work in urban areas for better opportunities, studies, schools for children and moonlighting (64,72,76). Females constitute a higher proportion of the nursing workforce (27,76) and they prefer urban areas than rural area (64) .Over the years there has been an increase in male nurses and they prefer 4-year university training with the intention

of leaving the profession later in years (76). Of importance to note was the attrition rate of nurses was due to ageing workforce and changing profession (64,77).

A retrospective descriptive study done by Vries and Reid (2003) investigated the career choices of medical graduates of rural origin in South Africa and determined the proportion of the medical doctors who were still working in the rural area (75). Survey questionnaires were given to two cohorts of medical doctors (sample A&B) and comparison of initial addresses when they were enrolled into the medical school with their current addresses of work was done(75). The results from the study showed that in sample A, 45.9% of the rural-origin respondents were in rural practice, compared with 13.3% of the urban-origin respondents (p<0.001) (75). In sample B, 41.61% of the rural-origin graduates were still in rural practice compared with 5.08% of urban-origin graduates (p < 0.001) (75). The findings showed that the South African situation was no different with other countries and that students from rural-origin are more likely to work in rural areas (75). Therefore, consideration of rural or urban origin on recruitment of nursing students either in school or work is important to address some of these job location imbalances (64).

Poor working conditions, health facilities characteristics and lack of equipment also pushes nurses away from rural facilities and public sectors (64). Two studies done in South Korea for new nursing graduates also revealed these factor (78,79). They both examined factors related to retention and choosing certain job locations by new graduate nurses and those who were already working (78,79). It was a secondary data analysis of a longitudinal data set from Graduates Occupational Mobility Survey (GOMS) (78,79). The sample consisted of 351 new graduates whose first job was a full-time registered nurse in a hospital (79) and the other sample included 533 nursing graduates who were working full time as registered nurses in hospitals or clinics (78) and were both followed up for three years (78,79). Survival analysis was conducted to compare the nurse retention in these three geographic locations capital, metropolitan and nonmetropolitan (78,79). Factors which included individual, family, nursing education, hospital and job dissatisfaction were assessed to determine their contribution or effect on movement (78,79). The findings from both studies showed that the survival probabilities of nurses working in the capital and nonmetropolitan areas were significantly different (78,79). Generally, nurses who were employed in the nonmetropolitan areas were more mobile and dissatisfied with

their jobs and the main reasons were; i) wanting better salaries, ii) fringe benefits, iii) employment security and iv) personal growth in their careers (78,79). In conclusion, it was noted that hospital characteristics which involved the location, working conditions and job satisfaction were significantly associated with job location choices and retention of new graduate nurses (78,79).

A qualitative study done in Pakistan which was looking at the job satisfaction among nurses working in the private and public sectors showed that the presence of a well-trained health workforce is vital, and that certain aspects of its organization are key, including numbers (available quantity), skill mix (health team balance), distribution (urban/rural), and working conditions (compensation, nonfinancial incentives, and workplace safety) (80). This study identified the need to reform policies that retain nursing workforce which include simple measures requiring better management practices which could improve the working environment and hence retain nurses (80).

Nursing shortages due to low salaries, minimal benefits and more career options has been shown to strain the few nurses left behind resulting in intolerable working conditions like high workload and long working hours to cover the gaps (81). This has resulted in more nurses leaving and creating even worse situations and shortages. A similar situation was seen in South Africa where the public sector was under enormous pressure due to escalating HIV/AIDS and tuberculosis together with dwindling funds for the private health insurance which was now supporting less than 15% of the population (76). Due to the pressure, nurses started moving from public-private sector and a drop of 2% was noted in public sector, and a rise of 7% in the private sector (27,76). In general, approximately 44% of the professional nurses were in the public sector by 2007 (27,76).

A study done in hospitals in China and Europe evaluated the association between availability of resources for nurses, nurse-patient ratio and patient outcomes (82). This cross-sectional study of 9688 nurses and 5786 patients in 181 Chinese hospitals compared the results to a similar study in Europe (82) and reported that 30% of nurses in China had high burnout due to high patient-nurse ratio and 45% were dissatisfied with their jobs because of poor work environment (61%) which affected the quality of care (29%) and thus graded their hospital low on patient safety

(36%) (82). Higher patient-to-nurse ratios were generally associated with unfavourable responses by nurses (burnout, dissatisfaction etc.) but were unrelated to patient outcomes (82). Instead, the availability of university-trained nurses was strongly associated with better patient outcomes, thus increasing patient satisfaction, high ratings, and willingness to recommend their hospital to others (82). Improving quality of hospital work environments and expanding the number of baccalaureate-prepared nurses hold promise for improving hospital outcomes in China (82).

The literature presented above demonstrates that the majority of the studies are mainly looking at the competency of university-trained versus college-trained professional nurses (36,37,54–57) but there is limited evidence on factors associated with the job location choices and retention of university-trained and college-trained professional nurses, hence the need for conducting the present study.

1.2 Problem Statement

Nurses form the largest health workforce in most countries. With global shift towards promotive and preventive services, and South Africa going through the process of primary health care reengineering, there is a need for more professional nurses with both leadership and clinical skills to implement universal health care. In addition, these professional nurses may also be willing to work in underserved areas like communities, clinics, rural areas and the public sector. Professional/registered nurses in South Africa have at least attained a 4-year degree or diploma in university or college respectively (reference). The current nursing education reforms are an opportunity for enhancing the performance of the nurses and are promoting university-trained professional nurses as opposed to college-trained professional nurses to match the complex changes in disease profiles as well the PHC reengineering professional needs. However, there is limited evidence on the effect of these changes in the distribution of the overall nursing workforce of the country given that certain job locations like rural facilities or the public sector are not attractive for many nurses who prefer urban facilities and the private sector. The implementation of the National Health Insurance (NHI) in South Africa plans to also address the shortcomings and disparities in the current public and private healthcare sectors (reference). Hence a concern that the nursing education reforms might worsen the current situation of imbalances in certain job locations.

In addition, the lack of information also exists on how long university and/or college-trained nurses will remain in particular job locations and factors that might influence their retention in the underserved areas, should they be willing to work in these areas. This study was conducted to generate evidence aimed at assisting policy makers in making informed decisions related to the current nursing education reforms.

1.3 Justification

This study will provide needed information on the job location choices of college-trained and university-trained nurses, the factors associated with these choices over time as well as the survival time of this nursing workforce in the public sector in South Africa. This study will contribute to the pool of information that is useful for the policy makers especially the National Department of Health (NDoH), the South Africa Nursing Council (SANC) and the Council for Higher Education (CHE) when determining ways by which skills and job location imbalances can be reduced in South Africa, thereby designing the nursing reforms that best optimise benefits for disadvantaged communities. The study report will also assist these stakeholders to derive comprehensive strategies/policies on the recruitment of students into universities, the recruitment of nurses in certain job locations as well as their retention in underserved job locations like clinics, rural and the public sector (8,48).

1.4 Aim and Objectives

1.4.1 Study aim
To examine the job location choices of university and college-trained nurses and the determinants of those choices in a cohort of graduating nurses followed up for 6 years.

1.4.2 Research question
Are university-trained professional nurses more likely than college-trained professional nurses to choose to work in certain types of facilities, sectors or areas?

1.4.3 Study objectives
1. To compare the sociodemographic characteristics of university-trained and college-trained professional nurses in 2008 at baseline of the cohort study.

2. To compare the job location choices of university-trained and college-trained professional nurses in 2015 after 6 years of follow up in the cohort.
3. To compare the time to leaving the public sector of university-trained and college-trained professional nurses in the cohort over the period from 2009 to 2015.
4. To analyse the reasons given for changing job location of university-trained and college-trained professional nurses in the cohort over the period from 2009 to 2015.

CHAPTER 2: METHODOLOGY

2.0 Description of the Primary Study

The primary study investigated the mobility patterns of professional nurses with regards to changes in their job location or job position and the reasons for such changes (83). Final year nursing students who were due for their graduation were enrolled into the study in 2008 and followed up regularly until 2015. A total of eight follow-ups were conducted as shown in Table 1. The data collected were similar although the format was changed slightly from follow-up 7, including additional questions asked on the reasons for job changes since the last follow-up.

Table 1: Description of periods of follow-ups for the primary study

Follow-up	Date of follow-up	Follow-up months	Total cohort members at each follow-up
Baseline	2008	0	377
2	Jan/Feb 2009	3	377
3	June/Jul/Aug 2009	6	376
4	Nov 2009	12	373
5	Oct/Nov 2010	24	373
6	Nov 2011	36	370
7	Nov/Dec 2012	48	368
8	Jan /Feb 2014	60	365
9	Feb 2015	72	356

A total of 377 nursing students were enrolled into the cohort comprising of 71 from universities and 306 from colleges; 216 from Gauteng and 161 from North West provinces. In 2009, they all started their community service in the public sector before moving to other job locations. The baseline information in the primary study was collected using self-administered questionnaires and thereafter follow-up data was collected using telephone-administered questionnaires (see appendix 1). The same questions were asked each year relating to changes in job movements that took place in the previous year. For example, the questionnaire for January 2015 interrogated job movements from January 2014 up to January 2015. Sociodemographic variables collected at baseline included *age*, *sex*, *province*, *ethnicity*, *birth place*, *nursing career as first choice*, and *trained in rural area*. Variables that were collected at baseline and in the subsequent follow-up years

included *marital status* and *date of change in status*, *having children* and *date of birth of the children*, and *number of children*. Other additional variables collected during annual follow-ups were on current job locations (rural/urban areas, hospital/clinic, private/public sector) and change in job location with associated reasons.

2.1 Description of the Present Study

2.1.1 Study design

This is a secondary data analysis of a longitudinal prospective cohort study of professional nurses who were enrolled into the study in 2008 and followed-up from 2009 to 2015.

2.1.2 Study population and sample

The study population comprise of 377 professional nurses who were enrolled into the primary study from colleges and universities in the North West and Gauteng provinces.

2.1.3 Description of the study variables

2.1.3.1 Outcome variables

The outcome variable was job location choice defined as sector type (public, private for profit or private-not-for-profit), work area (rural or urban) and facility type (clinic, community health centre, hospital or other).

2.1.3.2 Exposure variables

The main exposure variable of interest was the training institution type of the professional nurses classified as either university or college training.

2.1.3.3 Other explanatory / confounding variables

Sociodemographic variables such as *age*, *sex*, *marital status*, *having children*, *the number of children*, *ethnicity*, *area of birth*, *having nursing as a first career choice* as well as *location of the training institution attended* were considered as confounding variables based on evidence from literature. Table 2 presents a detailed description of the variables that were selected from the primary study data in order to answer the objectives of this current study.

Table 2: Description of study variables and their coding during analysis

#	Variable Name	Type	Description/ Definition	Original coding variable	Variable coding during/after analysis
Outcome variables					
1.	**Sector**	Categorical	The employment sector of the participants' current job	1=Public sector 2=Private-for-profit sector 3=Private-not-for-profit/NGO	Same coding as original data sets from 3 to 2 main responses where: 1=Public 0=Private (recoding of 2 & 3) Used for Objective 2, 3 & 4
2.	**Work area**	Categorical	The geographic location of the participants current employment	1=Deep rural village 2=Rural village 3=Small town in a rural area 4=Small town in an urbanised area 5=Large town 6=City	Recoded work area from 6 to 2 main response categories where: 1=Rural (recoding of 1-3) 2=Urban (recoding of 4-6)
3.	**Facility type**	Categorical	The type of facility where participant is currently working	1.Clinic 2.CommunityHealth Centre (CHC) 3. Hospital 9. Other	Recoded to combine clinic& CHC where: 1=Clinic/CHC 2=Hospital 9=Other
Exposure variables					
1	**Institution**	Categorical	Type of institution where participants were trained	1=College 2=University	Recoded into an indicator variable 'University' for objective 2, 3 and 4 where: 1=University (recoding of 2 in the original coding) 0= College (recoding of 1 in the original coding)
Explanatory/Confounding variables					
1.	**Marital status**	Categorical	Marital status of participants at baseline	1.Single 2.Married (or with long-term partner) 3.Divorced/separated 4.Widowed	Recoded into an indicator variable 'Single' for objective 2,3 and 4 where: 1=Single (recoding of 1 in the original coding). 0=Married/Divorced/Widowed (recoding of 2-4 in the original coding). Indicator variable 'Married' also generated. 1=Married (recoding of 2 in the original coding) 0= Single/Divorced/Widowed (recoding of 1, 3 & 4 in the original coding)
2.	**Province**	Categorical	Province where participant was born	1=Gauteng 2=North West	Recoded into an indicator variable 'Gauteng' for objective 2, 3 and 4 where: 1=Gauteng (recoding of 1 in the original coding) 0= North West (recoding of 2 in the original coding)

#	Variable Name	Type	Description/ Definition	Original coding variable	Variable coding during/after analysis
3.	**Age (years)**	Continuous	Age of participant at baseline	Actual age in years	Recoded into an indicator variable 'Under30' for objective 2, 3 and 4 where: 1=Under30 (recoding of participants' ages below 30 years in the original coding) 0= Above 30 (recoding of all participants' ages 30 years and above in the original coding)
4.	**Any Children**	Categorical	Whether participant has children or not	1=Yes 2=No	Same coding as in original dataset where Yes= is having 1 child or more and No=No child at all.
5.	**Number of Children**	Categorical	Number of children participants have	Actual number (0-6)	Same coding as in original dataset.
6.	**Ethnicity**	Categorical	Description of participants in relation to population group	1=Black 2=Coloured 3=Indian 4=White	Recoded into an indicator variable 'White' for objective 2 and 3 where: 1=Whites (recoding of 4 in the original coding) 0= black/coloured/Indian (recoding of 1-3 in the original coding)
7.	**Born area**	Categorical	Description of participants' area of birth	1=Very rural 2=Relatively rural 3=Urban (town) 4=Urban (city)	Recoded to collapse 4 to 2 main responses where: 1=Rural (recoded 1 & 2) 2=Urban (recoded for 3 & 4) then generated new variable born in rural area below.
8.	**Born in a Rural Area**	Categorical	Description of participants' area of birth	1=Yes 0=No	Same coding as in original dataset where Yes=Rural and No=Urban
9.	**Trained in a Rural Facility**	Categorical	Whether participants spent any time in a rural hospital or a rural community health centre or a rural clinic during training	1=Yes 2=No	Same coding as in original dataset where Yes=Rural and No=Urban.
10.	**Nursing First Choice**	Categorical	Whether nursing was participants' first choice as a career	1=Yes 2=No	Same coding as in original dataset where Yes=Nursing as first career choice and No= is either a second choice or more.

2.1.4 Data Analysis

2.1.4.1 Data Extraction, Processing & Management
Variables within the dataset received were already numerically coded. The dataset was received as unmerged Stata files for baseline and eight follow-ups. First, each data file was opened and explored for completeness of variables using Stata command*s*. In follow up 8 and 9 datasets, facility type which is an outcome variable for job location was coded differently when compared to the other datasets 2 to 7 which would cause problems on analysis. To solve that, the facility type variable was recoded to correctly classify the facility types as clinic, community health centre, hospital or Other (for NGOs or unclassified) as represented in follow up 2 to 7 data sets. Facility codes were used to correct the classification, and the 5th digit in the code from left represented the facility type,1=clinic, 2=community health centre and 3=hospital. These were extracted using a Stata command and later recoded. The blank facility code with a facility name was recoded as "Other".

For objective 1, the baseline dataset was used to compare sociodemographic characteristics of study participants and the institution types they were trained. All sociodemographic characteristics were analysed including missing values to account for all study participants interviewed at baseline.

For objective 2, the baseline dataset was merged with the eight follow-up datasets before analysis. Prior to merging, the following recoding was done (Table 2); gender was recoded into an indicator variable 'male' where participants were either male or female. Age was recoded into 'under 30' where participants were either below 30 years or 30 years and above; institution type was recoded into an indicator variable 'university' where participants were either university graduates or college graduates. Ethnicity was recoded into 'Whites' where participants were either white or non-whites (black/coloured/Asian); marital status was recoded into two new variables- 'single' where participants were either single or married/widowed/divorced. The job location choices were defined as sector type (public or private sector), work area (rural or urban area) and facility type (clinic/CHC, hospital or other) after 6 years of follow-up which was at follow-up 9.

For objective 3, first, all the data sets were appended to the baseline dataset creating a long format master set. Secondly, the data was restructured to prepare for

survival analysis. The restructuring involved creation of a composite status indicator to identify different important events such as the number interviewed (0 if not interviewed) in each follow-up, the number not working (1 if not working), the number not working as nurses (2 if not working as nurse), the number working in public sector (3 if working in the public sector). Next, the dataset was simplified by keeping only the variables of interest for the survival analysis and dropping the rest. From the simplified dataset, a new variable was created to indicate sequence of events over follow-up which was then used to find first private work and first loss to follow up in sequence. A binary outcome was then created to establish when loss to follow up happened among those lost before last follow-up. After determining when the loss to follow up happened, the final survival outcomes of interest were then generated. The time to event variable was assessed by using follow-up dates with events happening half-way between follow-ups and this was stated in months. Time to changing job location was defined as first movement from public to private sector.

For objective 4, changing jobs was defined as movement from public to private sector, from rural to urban area and from clinic to hospital or other and the reasons for changing were determined by recoding the open-ended questions for reasons for leaving work into ten broad categories, leaving because of conflict with management, salary increases, personal reasons, furthering studies, to be closer home, dissatisfied with job, poor working conditions, was transferred and due to contract termination. These reasons were recoded for follow-up 7 up to nine which is where the questions on reasons for leaving jobs were captured in the questionnaires. Both the coded reasons for job changes that came with the dataset and the ones without codes under other reasons were recoded into these categories for analysis.

2.1.4.2 Statistical Analysis by Objective

For objective 1, a bivariate analysis was conducted comparing sociodemographic characteristics for study participants and the institution type where they received their nursing training i.e. college or university at baseline. For the age and number of children variables, a t-test with equal variances was conducted to test for association with institution type of participants training. This was done to account for the numeric nature of these variables against the categorical exposure variable, institution type. For all the other variables, given that they were all categorical in nature, the Pearson chi-square test was conducted to test for association between the variables. A summary table showing each sociodemographic variable against the main exposure variable, training institution type, was developed in MS Word based on the bivariate analysis outputs.

For objective 2, a bivariate analysis comparing job location choice to institution type was conducted on the merged dataset for baseline and follow-up 9. The Pearson's chi-square test was used to assess association between the two categorical variables. A simple logistic regression analysis was then conducted to determine strong predictors of job location choice. The choice of a simple logistic regression was done after comparing different multinomial logistic regression models, given that the outcome had more than 2 levels. After finding that they were comparable, logistic regression model was then chosen for simplicity. To allow for the logistic regression to be applicable, the outcome variables were recoded into binary outcome i.e. to private/public and to rural/urban. For the third outcome variable, the multinomial regression was applied given that it had three categories, clinic/CHC, hospital and other.

For objective 3, Kaplan Meir curves were used to describe the survival in public sector of university-trained and college-trained professional nurses from 2009 when they started their community service in the public sector to 2015 follow-up when the present study ended. The two curves of university-trained and college-trained professional nurses were compared. The log-rank test for equality of survivor estimates was applied to determine statistical differences in the average time to leaving the public sector by training institution type. To control for confounders, a cox hazard regression model was applied to determine statistically significant predictors

of job location choice among the study participants. These predictors were informed by the results of the logistic regression in Objective 2.

In objective 4, frequency tables were generated in order to analyse the reasons given for changing job location among university-trained and college-trained nurses in the cohort over the period from 2009 to 2015. The data was grouped into 10 distinct responses which are; i) job dissatisfaction, ii) wanting higher salary; iii) furthering studies; iv) conflict with supervisor; v) work related transfer; vi) wanting to be closer home; vii) personal reasons; viii) career advancement/new challenge; ix) unhappy with working conditions; x) termination of contract/resignation.

2.2 Ethical Considerations

This study was approved by the University of the Witwatersrand Human Research Ethics Committee (Medical), clearance certificate number M160642. Written permission was further obtained from the Principal Investigator to use primary data. The results of the study will only be shared with the research team, the School of Public Health supervisors and examiners.

CHAPTER 3: RESULTS

3.0 General follow-up results

A total of 377 professional nurses participated in the study. Table 3 below shows an overview of the study follow-ups and the outcomes of the participants of whether they were located, interviewed, still participating in the study and still working. The average response rate of those successfully interviewed at each follow-up was 98.4%. The total number at each follow-up include those successfully interviewed, those who died, refused further participation and were lost to follow up (LTFU). Therefore, the total number at each follow-up plus missing data add up to 377. LTFU is the number of participants who were not telephonically located or interviewed. Those working were those successfully interviewed and mentioned that they were still working as professional nurses.

Table 3: Overview of study follow-up and response rates

Follow up	Months of follow up	Total at each follow up	Interview status				Working
			Successful N(%)	Died	Refused	LTFU	
Baseline	0	377	377	0	0	0	0
2	3	377(100.0)	374(99.2)	1	2	0	354
3	6	376(99.7)	372(98.9)	1	3	1	365
4	12	373(98.9)	373(100.0)	1	0	3	365
5	24	373(98.9)	363(97.3)	1	3	4	362
6	36	370(98.1)	363(98.1)	2	5	7	359
7	48	368(97.6)	365(99.2)	2	1	9	361
8	60	365(96.8)	351(96.2)	3	11	12	351
9	72	356(94.4)	349(98.0)	3	7	18	332
Total				3	32	18	

3.1 Professional nurses' characteristics by training institution type

Table 4 and Table 5 below compare the sociodemographic characteristics of university-trained and college-trained professional nurses (both categorical and numerical variables).

Table 4: Association between training institution type and professional nurses' sociodemographic characteristics: categorical variables

Categorical variables	Total N=377		University N=71		College N=306		P-value
	n	%	N	%	N	%	
Province							
Gauteng	216	57.3	20	28.2	196	64.1	<0.001***
North West	161	42.7	51	71.8	110	35.9	
Sex							
Male	54	14.3	9	12.7	45	14.7	0.660
Female	323	85.7	62	87.3	261	85.3	
Age group							
20-24	97	25.7	38	53.5	59	19.3	
25-29	86	22.8	9	12.7	77	25.2	
30-34	94	24.9	13	18.3	81	26.5	<0.001***
35-39	42	11.2	9	12.7	33	10.8	
40+	55	14.6	1	1.4	54	17.6	
Missing	3	0.8	1	1.4	2	0.6	
Marital Status							
Single	245	65	54	76.1	191	62.4	
Married	113	29.9	17	23.9	96	31.4	
Divorced/Separated	7	1.9	0	0.0	7	2.3	0.130
Widowed	7	1.9	0	0.0	7	2.3	
Missing	5	1.3	0	0.0	5	1.3	
Have a child							
Yes	230	61.0	24	33.8	100	32.7	<0.001***
No	147	39.0	47	66.2	206	6.3	
Ethnicity							
African	335	88.9	46	64.8	289	94.4	
Coloured	11	2.9	2	2.8	9	2.9	<0.001***
White	29	7.7	23	32.4	6	2	
Missing	2	0.5	0	0.0	2	0.7	
Area of birth							
Rural	176	46.7	39	54.9	137	44.8	
Urban	199	52.8	32	45.1	167	54.6	0.344
Missing	2	0.5	0	0.0	2	0.6	
Nursing was first study choice							
Yes	150	39.8	38	53.5	112	36.6	
No	226	59.9	33	46.5	193	63.1	0.030*
Missing	1	0.3	0	0.0	1	0.3	
Trained in rural area							
Yes	198	52.5	62	87.3	136	44.4	
No	175	46.4	9	12.7	166	54.3	<0.001***
Missing	4	1.1	0	0.0	4	1.3	

*<0.05, **<0.01, ***<0.001

Table 5: Professional nurses sociodemographic characteristics by institution type: numerical variables

Numerical Variables	Observations	Mean	Standard deviation	P value (Student T-test)
Age				
College	304	31.9	7.8	
University	70	27.0	5.6	<0.001***
Combined	374	32.0	7.7	
Missing	3			
Participant's number of children				
College	306	1.1	1.1	
University	71	0.6	0.9	<0.001***
Combined	377	1.0	1.1	

*<0.05, **<0.01, ***<0.001

Approximately two thirds (64.1%) of the college-trained professional nurses were from Gauteng province and more than two thirds (71.8%) of university-trained nurses were from North West province, and the difference was highly significant (p<0.001). Females constitute a higher proportion for both university-trained (87.3%) and college-trained (85.3%) professional nurses but the differences were not statistically significant (p=0.660).

The mean age (±SD) of the professional nurses was 32 years (±7.7) and a quarter (25.7%) was in the age group of 20-24 years. University-trained professional nurses were younger with a mean age of 27.0 years as compared to 30.9 years for college-trained professional nurses. More than half (53.5%) of the university-trained nurses were aged below 25 years compared to only a fifth (19.3%) of the college-trained nurses. The differences in age groups and mean age for professional nurses trained in colleges and universities was statistically significant (p<0.001). Most of the professional nurses were single (65%) with a third (31.4%) of the college-trained professional nurses being married compared to almost a quarter (23.9%) for the university-trained nurses, and the differences in marital status was not statistically significant (p=0.130). Most of the professional nurses had at least one child (61%) with college-trained professional nurses tending to have more children compared to their university colleagues, mean number of children 1.1 compared to 0.6, as shown

in Table 5 above. Two thirds (67.3%) of the college-trained nurses had at least one child as compared to a third (33.8%) of university-trained nurses and the differences in the number of children were statistically significant (p<0.001). In terms of ethnicity, black (African) nurses comprised the majority in both college and university-trained cohorts, 94.4% and 64.8% respectively and there were significantly more white nurses with university training (32%) compared to those with college training (2%) and the differences in ethnicity was statistically significant (p<0.001). More than half (54%) of university-trained nurses indicated that nursing was their first choice career compared to a third (37%) of college-trained nurses (p=0.030). More than four fifths (87.3%) of university-trained nurses had their training in the rural area compared to less than a half (44.4%) of college-trained nurses (p<0.001).

3.2 Job Location choices of college-trained and university-trained professional nurses after six years of follow-up.

Table 6 below compares the job location choices of the university- and college-trained professional nurses after six years of follow-up.

Table 6: Professional nurses' job location choices by training institution type

Category	Total N=332		University Trained		College Trained		p-value (Fisher' Exact test)
	N	%	n	%	n	%	
Sector							
Public sector	251	75.6	35	62.5	216	78.3	
Private for-profit	71	21.4	20	35.7	51	18.5	0.019**
Private not-for-profit	10	3.0	1	1.8	9	3.3	
Work-area							
Rural	83	25.0	18	32.1	65	23.6	
Urban	249	75.0	38	67.9	211	76.5	0.179
Facility type							
Clinic	94	28.3	13	23.2	81	29.4	
Community Health Centre	38	11.5	8	14.3	30	10.9	0.450
Hospital	142	42.8	22	39.3	120	43.9	
Other	58	17.5	13	23.2	45	16.3	

*<0.05, **<0.01, ***<0.001

The majority (75.6%) of all respondents were working in the public sector at the end of the last follow-up period, 78.3% of college-trained and 62.5% of university-trained, and this was statistically significant (p=0.019). A majority of the professional nurses (75.0%) regardless of the type of training institution were working in urban areas (67.9% for university-trained vs. 76.5% for college-trained nurses). Similarly, most professional nurses were working in hospital settings for both groups of nurses, 39.3% among university-trained nurses and 43.9% among college-trained nurses.

3.3 Factors associated with Job Location Choice

Table 7 below shows results of the binary logistic regression model of university training and other sociodemographic predictors of working in the private sector compared to the public sector.

Table 7: Predictors of professional nurses' job location in private sector

Categorical Variable Base outcome-Public	Adjusted OR	95% CI	P-value
University	0.797	0.322, 1.976	0.625
Gauteng	0.697	0.264, 1.840	0.467
Male	2.559	1.205, 5.432	0.014*
Under30	2.303	1.081, 4.903	0.031*
Single	1.079	0.488, 2.383	0.852
Having a child	0.457	0.229, 0.913	0.027*
Being white	7.730	2.030, 29.434	0.003**
Born in rural area	0.639	0.330, 1.233	0.182
Trained in a rural area	0.795	0.317, 1.997	0.626
Nursing as first career choice	0.466	0.220, 0.986	0.046*

*<0.05, **<0.01, ***<0.001

University training was not significantly associated with working in the private sector in the adjusted results (OR=0.80; 95%CI=0.32-1.98, p=0.625). The significant sociodemographic variables were gender, age, having a child, ethnicity and nursing as first career choice. Male professional nurses were 2.6 times (OR=2.57; 95%CI=1.11-5.44) more likely to be working in the private sector (p=0.014). Having a child had 54% less likely chance (OR=0.46; 95%CI=0.23-0.91) of working in private sector (p=0.027). Young nurses, those aged under 30 years of age, were 2.3 times more likely to work in the private sector (OR=2.3; 95%CI=1.10-4.89) (p=0.031).

Professional nurses of white ethnicity were 7.7 times more likely to work in the private sector (OR=7.7; 95%CI=2.02-29.36) than in public sector (p=0.03). Professional nurses who chose nursing as their first career choice had 53% (OR=0.47; 95%CI=0.22-0.99) less likely chance of working in the private sector (p=0.046).

Table 8 below shows results of the binary logistic regression model where working in an urban area after six years of follow-up was regressed against training institution type and individual sociodemographic characteristics.

Table 8: Predictors of professional nurses' job location in urban areas

Categorical Variable Base Outcome=Rural	Adjusted OR	95% CI	P-value
University	1.157	0.498, 2.690	0.735
Gauteng	5.787	1.696, 19.751	0.005**
Male	1.559	0.640, 3.797	0.329
Under30	1.043	0.484, 2.246	0.900
Single	1.518	0.743, 3.103	0.253
Having a child	0.663	0.295, 1 .490	0.320
Being white	2.807	0.287, 27.430	0.003**
Born in rural area	0.297	0.151, 0.583	<0.001***
Trained in a rural area	1.479	0.532, 0.433	0.767
Nursing was first career choice	0.903	0.460, 1.774	0.592

*<0.05, **<0.01, ***<0.001

University training was not a statistically significant predictor (OR=1.16; 95%CI=0.50-2.69, p=0.735). Professional nurses from Gauteng province were 5.8 times (OR=5.79; 95%CI=1.70-19.75) more likely to work in urban area than in rural area (p=0.005). Professional nurses of white ethnicity were 2.8 times (OR=2.81; 95%CI=0.29-27.43) more likely to work in urban areas than rural area (p=0.003). Professional nurses born in a rural area had 70% less likely chance of working in urban area than rural area (p<0.001).

Table 9 below shows the results of the multinomial logistic regression model of facility type location choice comparing hospitals and other types of facilities to CHC/clinic as the base outcome.

Table 9: Predictors of professional nurses' job location in different facilities

Categorical Variable Outcome=Facility type	Adjusted OR	95% CI	P-value
Hospital vs CHC/ Clinic			
University	1.184	0.531, 2.638	0.680
Gauteng	2.881	1.106, 7.507	0.030*
Male	1.116	0.508, 2.451	0.785
Under30	0.905	0.484, 1.691	0.753
Single	1.315	0.739, 2.341	0.352
Having a child	0.984	0.515, 1.883	0.962
Being white	1.375	0.331, 5.706	0.661
Born in rural area	0.675	0.395, 1.154	0.151
Trained in a rural area	0.531	0.216, 1.209	0.169
Nursing was first career choice	0.857	0.494, 1.488	0.584
Other facilities vs CHC/ Clinic			
University	0.852	0.301, 2.407	0.762
Gauteng	2.391	0.736, 7.771	0.147
Male	2.530	1.013, 6.322	0.047*
Under30	2.871	1.161, 7.101	0.022*
Single	1.026	0.422, 2.495	0.956
Having a child	0.593	0.256, 1.373	0.222
Being white	2.710	0.563, 13.029	0.213
Born in rural area	1.001	0.469, 2.157	0.988
Trained in a rural area	0.357	0.114, 1.116	0.076
Nursing was first career choice	0.545	0.237, 1.252	0.826

*<0.05, **<0.01, ***<0.001
Other facility refers to a facility that cannot be classified as a hospital, clinic or CHC

University training was not a statistically significant predictor of choice of facility type. Province was the only significant variable for job location choice in hospitals. Professional nurses from Gauteng province were 2.9 times (OR=2.88; 95%CI=1.11-7.51) more likely to work in hospitals than clinics/health centres (p=0.030). For other facility types, the significant variables were gender and age. Male professional nurses were 2.5 times (OR=2.53;95%CI=1.01-6.32) more likely to work in other facility type than clinic/health centre (p=0.047). Younger professional nurses below

30 years were 2.9 times (OR=2.87;95%CI=1.16-7.10) more likely to work in other facility type than a clinic/health centre(p=0.022)

3.4 Time to changing job location choice

This section presents results from the Kaplan Meir survival analysis estimates for time to change in job location for university-trained and college-trained professional nurses.

Firstly, analysis of loss to follow up was done to determine the retention rate. Figure 1 shows the overall proportion of loss to follow up during months of follow-up. Over 90% of the professional nurses were retained throughout the months of follow-up.
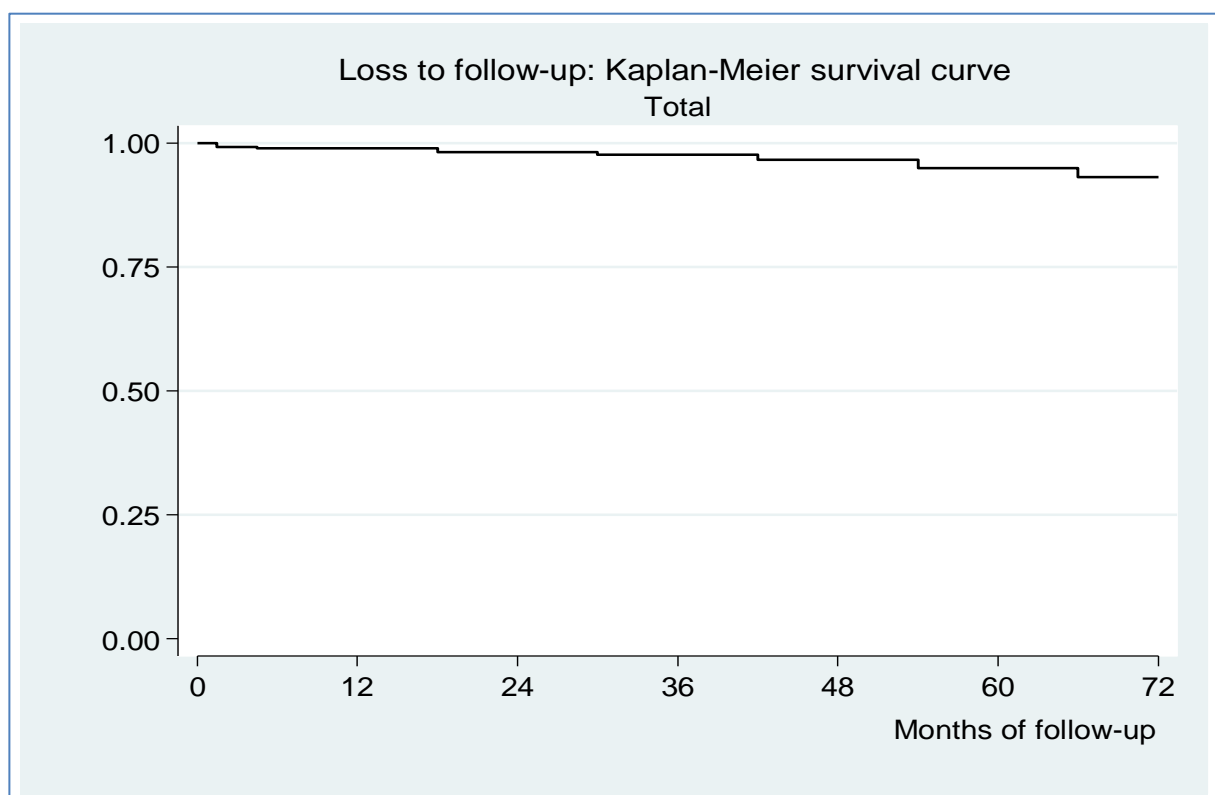

Figure 1: Loss to follow up estimates among the cohort of professional nurses

Figure 2 below shows the differences in lost-to follow-up by training institution type.
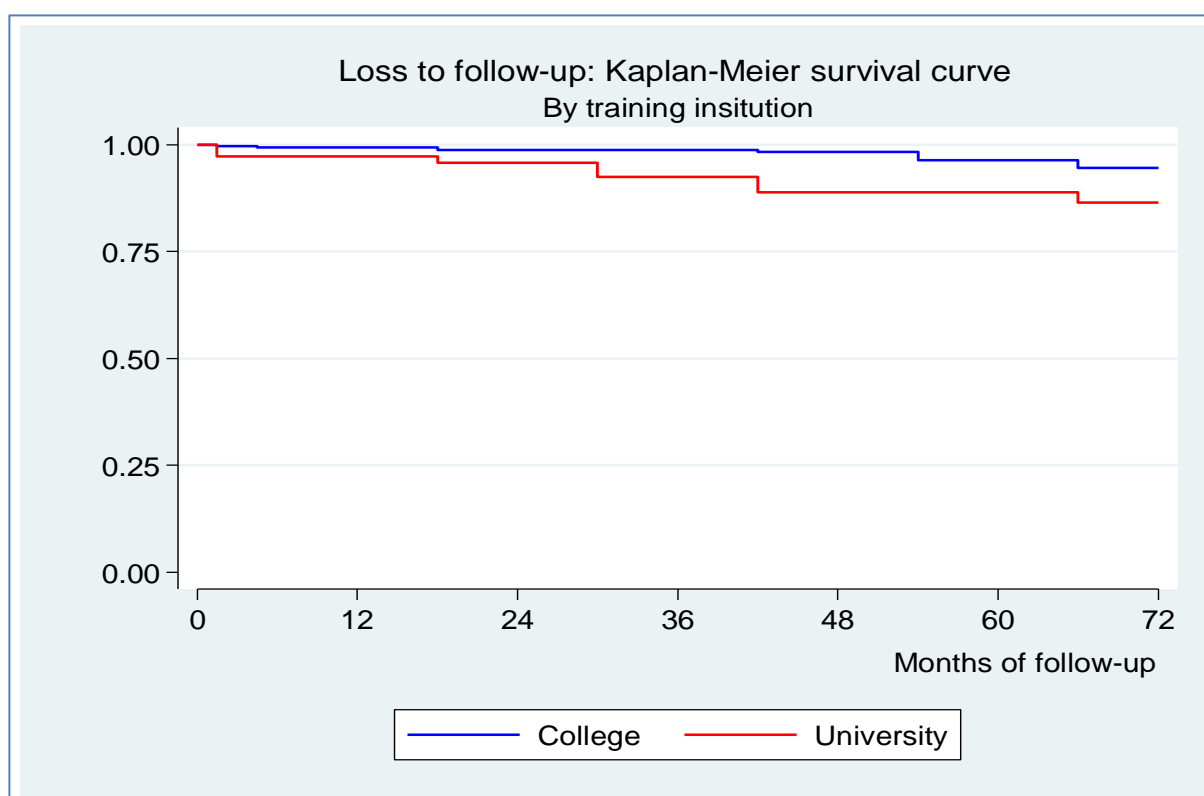
Figure 2: Time to being lost to follow up stratified by institution type

There were observed differences in the loss to follow up rates for respondents by institution type. The rate of loss to follow up was twice as high among university-trained professional nurses (0.002) as compared to college-trained professional nurses (0.001). The log rank test for differences was statistically significant (p=0.011).

All professional nurses started working in public sector as their job location, so change in job location was defined as the first change from public to private sector. The Kaplan Meir curve in Figure 3 below shows that movement to private sector started at approximately 18 months' post-graduation and by 60 months almost 25% had moved to private sector.

Differences were observed also between college-trained and university-trained nurses regarding their change in job location choice to private sector. The incidence rate of change from public to private sector was almost twice as high among university-trained professional nurses (0.008) as compared to college-trained professional nurses (0.005). The log rank test for differences was statistically significant (p=0.010). The proportion leaving the public sector after completion of community service is faster among university-trained professional nurses compared

to college-trained professional nurses. About 25% of university-trained professional nurses changed to private sector by 42 months compared to 25% of the college-trained professional nurses who changed by 66 months. The log rank test for the differences was statistically significant (p=0.010). Figure 4 presents these findings.
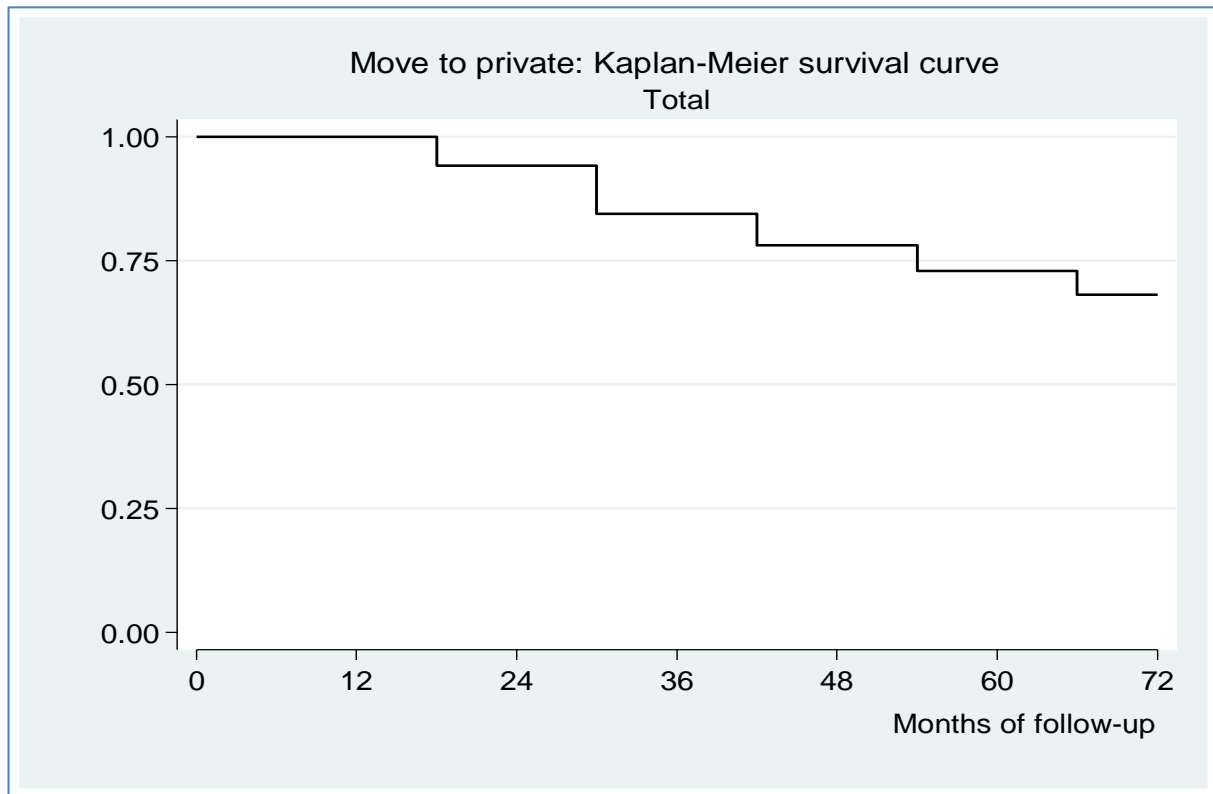

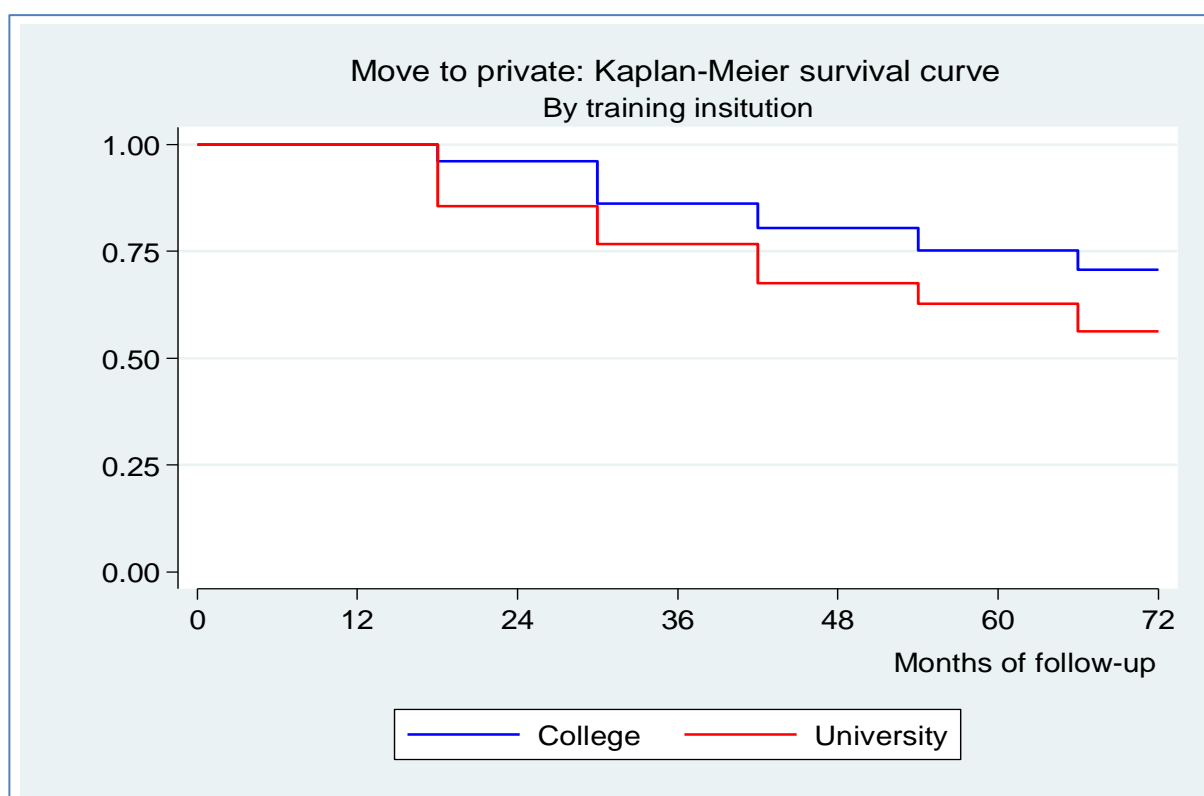**Figure 3: Time to changing job location choice to private sector**

Figure 4: Time to changing job location choice to private sector by institution type

3.4.1 Predictors of timing of move to the private sector

Table 10 below shows the results of the cox proportional hazard model evaluating the association between type of training and change to private sector when adjusted for confounders (baseline characteristics). University training was no longer significantly associated with time to move to the private sector in the adjusted analysis (HR=1.01; 95%CI=0.60-1.69, p=0.971. However, professional nurses below 30 years of age were 2.2 times (HR= 2.21; 95%CI: 1.35-3.62) more likely to change from public to private sector, those of white race were 3.1 times (HR = 3.16; 95%CI: 1.64-6.03) more likely to change from public to private sector and those who had nursing as their first career choice had 44% chance (HR=0.56; 95%CI: 0.36-0.89) of changing from public to private sector and they were all statistically significantly.

Table 10: Cox Proportional Hazard model of association between baseline characteristics of professional nurses and change to private sector

Variable	Hazard Ratios (HR)	95% CI	P-value
University	1.010	0.602, 1.692	0.971
Male	1.453	0.883, 2.391	0.141
Under30	2.211	1.349, 3.621	0.002*
Having a child	0.884	0.563, 1.389	0.593
Being white	3.163	1.658, 6.033	0.001**
Born in rural area	1.001	0.469, 2.157	0.988
Nursing was first career choice	0.562	0.355, 0.890	0.014*

*<0.05, **<0.01, ***<0.001.

3.5 Reasons for changing jobs

Three types of job changes were chosen based on literature review and areas of interest. Most authors cited underserved areas as being rural, public sector or clinics and that most nurses prefer working in urban, private and hospitals for various reasons. Therefore, understanding the reasons for leaving job locations of nurses in these underserved areas becomes very important to provide more insight and avoid worsening the already existing disparities. In this study, underserved areas are defined as rural, public sector and primary health care clinic. Table 12 below shows the reasons for changing job locations from public to private, rural to urban and hospital to clinic.

Table 11:Reasons for changing job location among Professional nurses by type of job location change

Reasons for changing jobs	To Private		To Urban		To Hospital	
	n = 61	% of cases	n = 40	% of cases	n = 19	% of cases
Dissatisfied with the job	21	27.3	9	16.1	6	20.7
Wanting to earn higher salary	15	19.5	6	10.7	1	3.5
Wanted to further studies	6	7.8	5	8.9	0	0.0
Conflict with management	1	1.3	1	1.8	0	0.0
Difficult working conditions	2	2.6	2	3.6	3	10.3
Personal reasons	4	5.2	2	3.6	0	0.0
To be closer home	5	8.2	12	21.4	5	17.2
Advancement in career and wanting new challenge	7	9.1	2	3.6	0	0.0

Reasons for changing jobs	To Private		To Urban		To Hospital	
	n = 61	% of cases	n = 40	% of cases	n = 19	% of cases
Was transferred	0	0.0	1	1.8	1	3.5
Termination of contract & resignation	0	0.0	0	0.0	1	3.5
Other	0	0.0	0	0.0	0	0.0

Out of the three chosen job changes, public to private sector changes were the most (n=61) followed by rural to urban (n=40) and lastly from clinic to hospital (n=19). Being dissatisfied with the job seemed to be a major contributor to all the three job location changes (64.1%), followed by wanting to be closer home (46.8%), wanting to earn higher salary (33.7%), wanting to further studies (16.7%), difficult working conditions (16.5%), advancement in career/wanting a new challenge (12.7%) respectively. The top 3 reasons for changing job location from public to private were dissatisfaction with job (27.3%), wanting to earn higher salary (19.5%) and advancement in career/wanting new challenge (9.1%). Changing job location from rural to urban was mainly due to wanting to be closer home (21.4%), dissatisfied with the job (16.1%), wanting to earn higher salary (10.7%) and wanting to further studies (8.9%). Changing from clinic to hospital was also mainly due to dissatisfaction with job (20.7%), wanting to be closer home (17.2%) and difficult working conditions (10.3%).

CHAPTER 4: DISCUSSION AND CONCLUSION

4.1 Discussion

4.1.1 Synopsis of Study Findings

The aim of this study was to compare the job location choices of college-trained and university-trained professional nurses in a cohort of graduate nurses from two South African provinces, Gauteng and North West. Job location choice, defined by type of sector (public, private for profit and private not for profit) was associated with training institution type after 6 years of follow up and was statistically significant (p=0.019) with more college-trained professional nurses in the public sector as compared to university-trained nurses. On the other hand, work area (urban or rural) and facility type (clinic/community health centre, hospital or other), was not associated with training institution type. Sociodemographic characteristics such as province where the professional nurses studied, their age or age groups, having a child or number of children, ethnicity, nursing as first career choice and being trained in rural area were also significantly associated with training institution type. When adjusted for these confounders, type of training was found not to be associated with any job location choice but instead gender (being male), ethnicity (being white), age (under 30 years), and having a child were high predictors of job location choice (sector type). Both university-trained and college-trained professional nurses changed from public sector at approximately 18 months. The rate of leaving the public sector as well as the proportion was higher among university-trained professional nurses compared to college-trained professional nurses. The log rank test for the differences was statistically significant. When adjusted for confounders, change from public to private sector was found not to be significantly associated with type of training but age below 30 years (HR=2.21;95%CI:1.35-3.62), being white (HR=3.16;95%CI:1.64-6.03) and nursing as first career choice (HR=0.56;95%CI:0.36-0.89) were strong predictors for changing to private sector. The top 3 reasons for changing job location choices from public to private, rural to urban and clinic/CHC to hospital were job dissatisfaction, wanting to be closer home and wanting to earn higher salary and for public to private only were job dissatisfaction, wanting to earn higher salary and advancement of career/wanting a new challenge.

4.1.2 Association between baseline characteristics and training institution type

The first objective of this study was to compare the baseline sociodemographic characteristics of university-trained and college-trained professional nurses and determine if there is any association. There were some significant differences in sociodemographic characteristics of university-trained and college-trained nurses. Overall, university-trained professional nurses were younger, white, had fewer children, had nursing as their first career choice and trained in rural area as compared to college-trained professional nurses. This indicates that besides type of training, these significant sociodemographic differences might also influence the job location choices of the university-trained and college-trained nurses.

The overall distribution of these sociodemographic characteristics could be related to the current situation of South Africa's enrolment into universities and colleges. Gauteng province constitute majority of the nurses (26.4%) and has several nursing colleges and about 7 universities compared to 2 universities and colleges in North West (27,84,85). Surprisingly when it comes to distribution of professional nurses from universities, North West has the second highest proportion after Limpopo province and Gauteng province is at 4th position (27,86).This was also seen in this study where more than two thirds of university-trained professional nurses were from North West. In South Africa, females constitute the majority of the professional nurses as well as African students followed by coloureds with the least as whites or Indians but when it comes to professional nurses in universities whites and Indians constitute a significantly higher proportion compared to colleges (27,86). This was also noted in this study where more than four fifths of the professional nurses were Africans but when it comes to university training, whites constituted 16 times more professional nurses in universities as compared to colleges. This could be due to access to resources and affordability. A longitudinal cohort study done in Korea to understand the characteristics of nursing students who chose nursing as first career choice compared to other non-nursing graduates revealed lower household income with better school academic achievements as some of the characteristics for nursing graduates (69). Subsequently employability (55%) was one of the factors that influenced nursing as their first career choice although highly satisfied(75%) about their qualifications (69). Another cross sectional study done in South Africa on scholarship utilisation for university-trained and college-trained professional nurses

showed that university-trained professional nurses utilised them more than college-trained nurses, a third versus a quarter respectively (68). The sociodemographic characteristics also showed that more whites (64.3%) and younger age group were in universities (68).

Although females constitute a higher proportion of the nursing workforce, over the years there has been an increasing number of males as professional nurses but most preferred 4 year degree nursing with intention of moving to other profession (76). Post-apartheid era encouraged more Africans to register as nurses and this has seen a 6-fold increase with a decrease of white intake (76). Of importance to note is that most whites preferred university training (76).

Most literature alluded to the ageing nursing workforce in South Africa with an average of 40 years but this study revealed a mean age of 32 years, with younger age group among university-trained nurses. This could be encouraging because over the years there has been an outcry of attrition of nurses.

4.1.3 Association between job location choice and training institution type

The second objective was to compare the job location choices of university-trained and college-trained professional nurses after 6 years of follow up in the cohort**.**

In the bivariate analysis, significant associations between type of training and job location choice particularly work sector were found. However, this association became insignificant when the multivariate analysis was applied suggesting that other factors confounded the relationship. This view is supported by study findings from the descriptive analysis of baseline characteristics of participants where province, age, having a child, number of children, ethnicity, being trained in a rural area as well as having nursing as first career choice were found to be significantly associated with type of training (university training or college training). The multivariate analysis found that being male, white race, age below 30 years and having a child were high predictors of choosing private sector when compared to public sector. Having studied in Gauteng province, being white and born in rural area were high predictors of choosing urban area as compared to rural area. Then for facility type, having studied in Gauteng province had high likelihood of choosing hospital than clinic, being male and below 30 years of years had high likelihood of choosing NGOs than clinic/health centres.

A longitudinal prospective and cross sectional study done in the United Kingdom comparing career choice and competence of three year university-trained and college-trained professional nurses showed little differences between the type of training and career choice (52). University-trained professional nurses were only found to have higher expectations, less satisfied with the job and intending to leave profession than college-trained professional nurses, but this was not statistically significant (76).

A retrospective descriptive study done by Vries and Reid in 2003 investigated the job location choices of medical doctors of rural origin. The findings demonstrated significant associations between rural origin and choosing rural area posts (p<0.001) (69). Although this study looked at medical doctors, this could also have applied to professional nurses.

There is generally little information on factors influencing job location choices by type of training. Most existing studies compared the competence of these cadres and only highlighted association with certain sociodemographic characteristics.

4.1.4 Differences in average time to job location change by training institution type

To compare the time to leaving the public sector of university-trained and college-trained professional nurses in the cohort over the period from 2009 to 2015.

The study found that both university-trained and college-trained nurses left the public sector after 12 months of community service. The proportion of professional nurses who changed at any given time was higher among university-trained compared to college-trained with some delay of approximately a year among college-trained nurses. The differences were statistically significant. When adjusted for confounders there was no association between type of training and time to leaving public sector. This probably indicates that there are other factors influencing the change of professional nurses from public to private sector.

These findings are supported by other longitudinal prospective studies done in Korea which found that the level of education be it diploma(college-trained) or degree(university-trained) had no influence in changing job locations after adjusting for confounders which were mainly sociodemographic factors (78,79). In Africa, there

has been not been any previous studies comparing time to leaving the public sector of both the university-trained and college-trained nurses. Some of the sociodemographic factors noted to have some influence were age, gender, marital status and ethnicity. The younger and single people with no family responsibilities have been alluded to be more likely to move from one place to the other, that women have been seen to be more likely to prefer work in urban areas and when they get married they are more likely to prefer working in close proximity to their spouses (42,60,61,72).

4.1.5 Reasons for changing job location among professional nurses

The last objective mainly looked at the reasons for changing job location choices of university-trained and college-trained professional nurses in the cohort over the period from 2009 to 2015. In this study, only 3 types of changes were analysed that is from public to private sector, rural to urban and clinic to hospital because these were the areas of interest and rural, public sector and clinics are considered underserved areas. It was important to understand the reasons of university-trained and college-trained professional nurses for leaving these underserved areas to assist with targeted interventions towards universal health care (9).The findings in this study showed that job dissatisfaction, wanting higher salary and moving closer home were the main reasons for changing these job locations and this is supported by other literatures (73,78,80).The difference with other studies was that job dissatisfaction category was expanded to include other components like managerial styles, relationship with colleagues and supervisor, working hours, availability of equipment and so on (73,78,80).

4.2 Limitations

This study made use of secondary data and the general limitation was using variables that existed. The objectives were, therefore, streamlined according to the information available, despite wanting a detailed analysis for completeness. The small sample size of university-trained professional nurses could have inhibited the power of the study, thus requiring a bigger study in future to confirm some of the findings. The confounding variables need further analysis to understand their effects over time. Unfortunately, in this study, the confounding variables which were mainly sociodemographic variables were assessed on baseline and were not followed-up over time. There was loss to follow up, though minimal, this may have introduced

some bias especially for university-trained professional nurses since the sample size was already small compared to college-trained professional nurses.

The self-reported job status and job location might be biased although the researcher made use of the country's classification of a clinic, hospital, rural or urban but for job status there was reliance on what the study participant relayed. The study looked at the first move to the private sector, this is potentially a limitation considering that some cohort members may have moved back to public sector and this was not accounted for. Of interest, was also the number of changes over time of each participant but this involved much complex analysis because of how the data was collected. The study cannot be generalised to the country especially for university-trained professional nurses because different universities may be exposed to different teaching and learning standards depending on location (rural/urban) or province. Although reasons for change in job location were collected, some were already predefined making it difficult to understand the specific reasons for each coded theme. For example, job dissatisfaction could mean a lot of things including but not limited to managerial styles, relationship with colleagues and supervisors, working conditions, working hours, no opportunities for career advancement. It was important to collect them as they were and code them later. The three chosen type of changes were in one direction, though the changes in the reverse direction could also be important and could have enriched the study.

4.3 Strengths

Because of the longitudinal nature of the study design, it was easier to determine the change of job locations over time and the factors associated with these changes unlike cross-sectional studies. This study determines the actual changes of job locations rather than intentions. This was also a strength because the researcher was able to attribute reasons as alluded by the participant unlike intentions where you find a participant still in the same job location and continuing to highlight that they would want to change. As a result, this then becomes difficult to document as a true reason for change. There was very minimal loss to follow up and the study retained above 90% of the participants. This meant that there was minimal systematic bias. This study was the first to compare job location outcomes for university-trained and college-trained professional nurses in South Africa with a few international studies.

4.4 Conclusions, Implications and Recommendations

The study findings reveal some associations between type of training and job location choices in the public or private sector though the differences are minor. A greater proportion of university-trained professional nurses have been seen to change from public to private sector at a higher rate as well as earlier than college-trained professional nurses. The main reasons noted were dissatisfaction, wanting a higher salary, advancement in career and wanting challenge. The dissatisfaction could probably be due to having the same posts as college-trained nurses and also wanting more leadership roles therefore exploring these reasons further would be important to come up with targeted interventions. Primary health care reengineering could partly address some of the reasons of the university-trained professional nurses as it envisaged more responsibilities, leadership roles and more critical thinking but then it becomes very important to also address opportunities for career advancement as the country continues with implementation.

At the end of the study, a larger proportion (more than two thirds) of both university-trained and college-trained professional nurses was still retained in the public sector which is encouraging because there is a chance to harness this potential benefit by addressing the factors that can further retain these university-trained professional nurses if they still prefer to eventually choose to remain in the public sector but it cannot be ignored that this can also suggest movement of back and forth although this study did not look at that.

The association of type of training and sector type becomes insignificant when adjusted for confounders, suggesting that sociodemographic factors might have some influence on the job location choices of these carders of professional nurses. Therefore, the current nursing education reforms might not have much implication on the implementation process of the primary health care reengineering and NHI since the two cadres have similar choices but consideration of these sociodemographic factors will need to be taken care of to ensure unwanted disruptions with continued movement/mobility of these professional nurses.

The disparity in job location choices between public and private sector can also be argued to be a result of better remuneration prospects, working conditions and more challenging /advanced equipment in the private sector more especially for university-

trained professional nurses. To counteract this continued drain in skills from public sector, strategies to retain university-trained nurses will have to go beyond financial rewards but also seek to address working conditions and open up new opportunities for growth and career advancement. In essence, this reaffirms the Human Resources for Health Strategy and vision for 2030 (87).

Being born in a rural area is a significant predictor for job location choice in rural area as demonstrated by the results of this study, although there was no association between type of training and work area (rural or urban) for both bivariate and multivariate analysis. These findings are also supported by existing literature on job location choice which have demonstrated associations between place of origin of medical graduates and their likelihood to be retained in those rural area posts (72). These findings reaffirm the need for recruitment strategies in nursing institutions that will give first preference to applicants from rural origin for rural positions in order to gradually close the disparities in the distribution of the workforce across the rural urban divide upon graduation.

Choosing a primary health care facility was influenced by province of study, age and gender, with those who studied in Gauteng province having a high likelihood of choosing hospital, being male and below 30 years of years had high likelihood of choosing NGOs. There was no association between facility type and job location choices both on bivariate and multivariate analysis. The influence of these sociodemographic factors seemed to not have much influence because the status could be different if professional nurses study in other provinces which are not necessarily Gauteng and North West and the nursing workforce in South Africa could be different with gradual change if more young and male professional nurses are recruited as shown in this study.

With regards to recommendations, the South African government could consider implementing the nursing education reforms and promoting primary health care re-engineering since these cadres have almost similar job location choices. The risk of worsening the current situation of job location imbalances seem to be minimal compared to the benefit of competency and better performance as revealed by several literatures (36,37,54–57). Considerations should therefore be made for certain sociodemographic factors like age, gender, ethnicity, having children, nursing

as first career choice, being born in rural area and training in rural area when enrolling or recruiting university students and professional nurses into certain nursing schools and job locations.

Beyond rural and scarce skills allowances and a community service requirement (31,32), South Africa would probably need a range of more targeted interventions to effectively manage the job location imbalances of professional nurses especially in the underserved job locations (16,17,28). Nursing education reforms should therefore mainly address the performance of professional nurses and improve their professional status just like other professionals in other disciplines such as doctors and engineers (22–24). A strong and well-educated nursing workforce, is of best interest to both patients and the healthcare system as they play an important role in patient safety, lowering mortality rates, preventing medical errors, and ensuring quality outcomes(38). There is need to ensure that nursing remains an attractive career choice with adequate preparation of graduates in-order-to meet the challenges of the ever changing complex disease profiles (38).

REFERENCES

1. Dye C, Reeder JC, Terry RF. Research for Universal Health Coverage. Sci Transl Med. 2013 Aug 21;5(199):199ed13-199ed13.
2. McIntyre D. Beyond fragmentation and towards universal coverage: insights from Ghana, South Africa and the United Republic of Tanzania. Bull World Health Organ. 2008 Nov 1;86(11):871–6.
3. Etienne C, Asamoa-Baah A, Evans DB. Health systems financing: The path to universal coverage. World Health Organization; 2010.
4. Campbell J, Buchan J, Cometto G, David B, Dussault G, Fogstad H, et al. Human resources for health and universal health coverage: fostering equity and effective coverage. Bull World Health Organ. 2013 Nov;91:853–63.
5. Grewar DA. Implementation of National Health Insurance in South Africa: views of healthcare managers in a private healthcare institution. 2017;
6. George G, Quinlan T, Reardon C, Aguilera J-F. Where are we short and who are we short of? A review of the human resources for health in South Africa. Health SA Gesondheid Online. 2012;17(1):1–7.
7. Daviaud E, Chopra M. How much is not enough? Human resources requirements for primary health care: a case study from South Africa. Bull World Health Organ. 2008 Jan;86(1):46–51.
8. World Health Organization. Executive Summary. A Universal Truth: No Health without a Workforce, Third Global Forum on Human Resources for Health Report. Geneva: Global Health Workforce Alliance; 2013.
9. World Health Organisation. Health Workforce Requirements for Universal Health Coverage and The Sustainable Development Goals. World Health Organisation; 2016.
10. Buchan J, Aiken L. Solving nursing shortages: a common priority. J Clin Nurs. 2008 Dec;17(24):3262–8.
11. World Health Organisation. World Health Statistics. Geneva: World Health Organisation; 2010. 178 p.
12. Dayi C, Grayii A, Budgelli E. Health and related indicators. South Afr Health Rev 2011. 2011;119.
13. Travis P, Bennett S, Haines A, Pang T, Bhutta Z, Hyder AA, et al. Overcoming health-systems constraints to achieve the Millennium Development Goals. The Lancet. 2004 Sep 4;364(9437):900–6.
14. Mayosi BM, Lawn JE, Van Niekerk A, Bradshaw D, Karim SSA, Coovadia HM, et al. Health in South Africa: changes and challenges since 2009. The Lancet. 2012;380(9858):2029–2043.
15. Kautzky K, Tollman SM. A perspective on primary health care in South Africa. South Afr Health Rev. 2008;2008:17–30.
16. Van Rensburg HCJ. Health and health care in South Africa. Van Schaik Publishers; 2004.
17. Crush J, Pendleton W. Brain flight: The exodus of health professionals from South Africa. Int J Migr Health Soc Care. 2011;6(3):3–18.
18. Dovlo D. Migration of nurses from sub-Saharan Africa: a review of issues and challenges. Health Serv Res. 2007 Jun;42(3 Pt 2):1373–88.
19. Rispel L, Moorman J, Chersich M, Goudge J, Nxumalo N, Ndou T. Revitalising primary health care in South Africa: review of primary health care package, norms and standards. Johannesbg Cent Health Policy Univ Witwatersrand. 2010;
20. Bach S. International migration of health workers: Labour and social issues. Geneva Int Labour Off [Internet]. 2003 [cited 2015 Jun 6]; Available from: http://www.rctfi.org/resources/ILO.pdf
21. Schaay N, Sanders D, Kruger V, Olver C. Overview of health sector reforms in South Africa. Lond U K DFID Hum Dev Resour Cent. 2011;48.
22. Spitzer A, Perrenoud B. Reforms in nursing education across Western Europe: implementation processes and current status. J Prof Nurs Off J Am Assoc Coll Nurs. 2006;22:162–71.
23. Blaauw D, Ditlopo P, Rispel LC. Nursing education reform in South Africa – lessons from a policy analysis study. Glob Health Action. 2014;7.
24. Jeffries PR. The Evolving Health Care System: The Need for Nursing Education Reform. J Prof Nurs. 2015 Nov;31(6):441–3.
25. Lehmann U. Strengthening human resources for primary health care: primary health care: systems support. South Afr Health Rev. 2008;2008(1):163–177.
26. Breier M, Wildschut A, Mgqolozana T. Nursing in a new era. Prof Educ Nurses South Afr [Internet]. 2009 [cited 2015 Sep 14]; Available from:

http://www.hsrcpress.ac.za/downloadpdf.php?pdffile=files/PDF/2258/Nursing.pdf&downloadfilen ame=Nursing

27. South African Nursing Council(SANC). South African Nursing Council Statistics [Internet]. 2018 [cited 2018 Oct 7]. Available from: http://www.sanc.org.za

28. Bezuidenhout M, Human S, Lekhuleni M. THE NEW NURSING QUALIFICATIONS FRAMEWORK. Trends Nurs. 2014 Aug 25;2(1):14–25.

29. Naidoo S. The South African national health insurance: a revolution in health-care delivery! J Public Health. 2012 Mar 1;34(1):149–50.

30. Munyewende PO, Rispel LC, Chirwa T. Positive practice environments influence job satisfaction of primary health care clinic nursing managers in two South African provinces. Hum Resour Health. 2014;12:27.

31. Mekwa J. Transformation in nursing education: chapter 13. In: Ntuli A, Crisp N, Clarke E, Barron P, eds. South African health review 2000. Durban: Health Systems Trust. In 2000. p. 271–83.

32. Subedar H. The nursing profession: production of nurses and proposed scope of practice: human resources. South Afr Health Rev. 2005;2005(1):88–101.

33. SA Nursing Council. SA Nursing Council Services. Community Service policy [Internet]. 2008 [cited 2015 Nov 9]. Available from: http://www.sanc.co.za/serv_csv.htm

34. Transforming Nursing Education to Meet Emerging Health Care Needs [Internet]. RWJF. 2012 [cited 2018 Mar 12]. Available from: http://www.rwjf.org/en/blogs/human-capital-blog/2012/09/transforming_nursing.html

35. Scheckel M. Nursing education: Past, present, future. Issues Trends Nurs Essent Knowl Today Tomorrow. 2009;27–61.

36. Lane S, Kohlenberg E. The Future of Baccalaureate Degrees for Nurses. Nurs Forum (Auckl). 2010 Oct;45(4):218–27.

37. Johnson JH. Differences in the performances of baccalaureate, associate degree, and diploma nurses: a meta-analysis. Res Nurs Health. 1988 Jun;11(3):183–97.

38. Raines CF, Taglaireni ME. Career pathways in nursing: Entry points and academic progression. Online J Issues Nurs. 2008;13(3):3.

39. Francis B, Humphreys J. Enrolled nurses and the professionalisation of nursing: a comparison of nurse education and skill-mix in Australia and the UK. Int J Nurs Stud. 1999 Apr 1;36(2):127–35.

40. Stein-Parbury J. Nursing around the world: Australia. Online J Issues Nurs. 2000;5(2):1–10.

41. Gambia Ministry of Public services. Scheme of service for the nursing cadre. [Internet]. azslide.com. [cited 2017 Nov 14]. Available from: https://slidex.tips/.../scheme-of-service-for-the-nursing-cadre-civil-service-of-the-gam...

42. Kenya Ministry of Health. Scheme of service for nurses in Kenya [Internet]. [cited 2017 Nov 14]. Available from: www.health.go.ke/.../SCHEME%20OF%20SERVICE%20FOR%20NURSING%20PER...

43. Uganda Ministry of Public Service. Schemes of service for the nursing cadre [Internet]. [cited 2017 Nov 14]. Available from: https://www.publicservice.go.ug/.../Schemes-of-Service-for-the-Nursing-Cadres.pdf

44. Mapanga KG, Mapanga MB. A perspective of nursing in Zimbabwe. Online J Issues Nurs. 2000;5(2).

45. Spetz J, Bates T. Is a baccalaureate in nursing worth it? The return to education, 2000–2008. Health Serv Res. 2013;48(6pt1):1859–1878.

46. Takase M, Nakayoshi Y, Yamamoto M, Teraoka S, Imai T. Competence development as perceived by degree and non-degree graduates in Japan: A longitudinal study. Nurse Educ Today. 2014 Mar;34(3):451–6.

47. Coovadia Hoosen, Jewkes Rachel,Barron Peter, Sanders David,McIntyre Diane. The health and health system of South Africa: historical roots of current public health challenges. The Lancet. 2009;374(9692):817–34.

48. Pagett C, Padarath A. A review of codes and protocols for the migration of health workers. Health Syst Trust [Internet]. 2007 [cited 2015 Jun 7]; Available from: http://www.aspeninstitute.org/sites/default/files/content/images/review%20of%20codes%20and%20protocols%20pagett.pdf

49. Chopra M, Lawn JE, Sanders D, Barron P, Karim SSA, Bradshaw D, et al. Achieving the health Millennium Development Goals for South Africa: challenges and priorities. The Lancet. 2009;374(9694):1023–1031.

50. Pijl-Zieber EM, Grypma S, Barton S. Baccalaureate nursing education: has it delivered? A retrospective critique. Nurs Leadersh Tor Ont. 2014 Jun;27(2):27–34.

51. Clinton M, Murrells T, Robinson S. Assessing competency in nursing: a comparison of nurses prepared through degree and diploma programmes. J Clin Nurs. 2005 Jan;14(1):82–94.

52. Robinson S, Murrells T, Hickey G, Clinton M, Tingle A. A tale of two courses: comparing careers and competencies of nurses prepared via three-year degree and three-year diploma courses. Kings College London; 2003.

53. Global Health Workforce Alliance. The Global Health Workforce Alliance Strategy 2013 to 2016. Advancing the Health Workforce Agenda within Universal Health Coverage [Internet]. World Health Organisation; 2012 [cited 2015 May 12]. Available from: http://www.who.int/workforcealliance/knowledge/resources/strategybrochure_En.pdf.

54. Callister LC, Luthy KE, Thompson P, Memmott RJ. Ethical Reasoning in Baccalaureate Nursing Students. Nurs Ethics. 2009 Jul 1;16(4):499–510.

55. Friese CR, Lake ET, Aiken LH, Silber JH, Sochalski J. Hospital Nurse Practice Environments and Outcomes for Surgical Oncology Patients. Health Serv Res. 2008 Aug 1;43(4):1145–63.

56. Needleman J, Buerhaus P. Nurse staffing and patient safety: current knowledge and implications for action. Int J Qual Health Care. 2003 Aug 1;15(4):275–7.

57. Blegen MA, Goode CJ, Park SH, Vaughn T, Spetz J. Baccalaureate Education in Nursing and Patient Outcomes: JONA J Nurs Adm. 2013 Feb;43(2):89–94.

58. Aiken LH, Clarke SP, Cheung RB, Sloane DM, Silber JH. Educational levels of hospital nurses and surgical patient mortality. Jama. 2003;290(12):1617–1623.

59. Aiken LH, Clarke SP, Sloane DM, Lake ET, Cheney T. Effects of Hospital Care Environment on Patient Mortality and Nurse Outcomes. J Nurs Adm. 2008 May;38(5):223–9.

60. Tourangeau AE, Doran DM, Hall LM, O'Brien Pallas L, Pringle D, Tu JV, et al. Impact of hospital nursing care on 30-day mortality for acute medical patients. J Adv Nurs. 2007 Jan 1;57(1):32–44.

61. Goode CJ, Pinkerton S, McCausland MP, Southard P, Graham R, Krsek C. Documenting chief nursing officers' preference for BSN-prepared nurses. J Nurs Adm. 2001;31(2):55–59.

62. Pardue SF. Decision-making skills and critical thinking ability among associate degree, diploma, baccalaureate, and master's-prepared nurses. J Nurs Educ. 1987;26(9):354–361.

63. Padarath A, Chamberlain C, McCoy D, Ntuli A, Rowson M, Loewenson R. Health personnel in Southern Africa: confronting maldistribution and brain drain. Durb Health Syst Trust. 2003;

64. Dussault G, Franceschini MC. Not enough there, too many here: understanding geographical imbalances in the distribution of the health workforce. Hum Resour Health. 2006 May 27;4(1):12.

65. Hickey N, Sumsion J, Harrison L. Why nursing? Applying a socio-ecological framework to study career choices of double degree nursing students and graduates. J Adv Nurs. 2013 Aug 1;69(8):1714–24.

66. Zurn P, Dal Poz MR, Stilwell B, Adams O. Imbalance in the health workforce. Hum Resour Health. 2004 Sep 17;2:13.

67. George G, Atujuna M, Gow J. Migration of South African health workers: the extent to which financial considerations influence internal flows and external movements. BMC Health Serv Res. 2013 Aug 6;13(1):297.

68. Roets L, Botma Y, Grobler C. Scholarship in nursing: Degree-prepared nurses versus diploma-prepared nurses. Health SA Gesondheid. 2016 Dec 1;21(Supplement C):422–30.

69. Cho S-H, Jung SY, Jang S. Who enters nursing schools and why do they choose nursing? A comparison with female non-nursing students using longitudinal data. Nurse Educ Today. 2010 Feb 1;30(2):180–6.

70. Lu H, While AE, Barriball KL. Job satisfaction and its related factors: A questionnaire survey of hospital nurses in Mainland China. Int J Nurs Stud. 2007 May 1;44(4):574–88.

71. Gilson L, Erasmus E. Supporting the retention of health resources for health: SADC policy context. Reg Netw Equity Health South Afr EQUINET Avilable Httpwww Equinetafrica OrgbibldocsDIS37HRes Pdf [Internet]. 2005 [cited 2015 Jun 21]; Available from: https://equinetafrica.org/bibl/docs/DIS37HRes.pdf

72. Rispel LC, Chirwa T, Blaauw D. Does moonlighting influence South African nurses' intention to leave their primary jobs? Glob Health Action [Internet]. 2014 Dec 22 [cited 2015 May 13];7. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4275643/

73. Delobelle P, Rawlinson JL, Ntuli S, Malatsi I, Decock R, Depoorter AM. Job satisfaction and turnover intent of primary healthcare nurses in rural South Africa: a questionnaire survey. J Adv Nurs. 2011 Feb;67(2):371–83.

74. Huicho L, Miranda JJ, Diez-Canseco F, Lema C, Lescano AG, Lagarde M, et al. Job Preferences of Nurses and Midwives for Taking Up a Rural Job in Peru: A Discrete Choice Experiment. PLoS ONE. 2012 Dec 20;7(12):e50315.

75. Vries E de, Reid S. Do South African medical students of rural origin return to rural practice? S Afr Med J. 2003 Jan 1;93(10):789–93.

76. Breier M, Wildschut A, Mgqolozana T. Nursing in a new era. Prof Educ Nurses South Afr [Internet]. 2009 [cited 2015 Sep 14]; Available from: http://www.hsrcpress.ac.za/downloadpdf.php?pdffile=files/PDF/2258/Nursing.pdf&downloadfilen ame=Nursing

77. Hall EJ. Nursing attrition and the work environment in South African health facilities. Curationis. 2004 Nov;27(4):28–36.

78. Cho S-H, Lee JY, Mark BA, Jones CB. Geographic mobility of Korean new graduate nurses from their first to subsequent jobs and metropolitan-nonmetropolitan differences in their job satisfaction. Nurs Outlook. 2014 Jan 1;62(1):22–8.

79. Cho S-H, Lee JY, Mark BA, Yun S-C. Turnover of New Graduate Nurses in Their First Job Using Survival Analysis. J Nurs Scholarsh. 2012 Mar 1;44(1):63–70.

80. Hamid S, Malik AU, Kamran I, Ramzan M. Job satisfaction among nurses working in the private and public sectors: a qualitative study in tertiary care hospitals in Pakistan. J Multidiscip Healthc. 2014;7:25.

81. World Health Organisation. World health report. Working together for health [Internet]. Geneva; 2006 [cited 2015 Jun 6]. Available from: http://www.who.int/whr/2006/ whr06_en.pdf

82. You L, Aiken LH, Sloane DM, Liu K, He G, Hu Y, et al. Hospital nursing, care quality, and patient satisfaction: Cross-sectional surveys of nurses and patients in hospitals in China and Europe. Int J Nurs Stud. 2013 Feb 1;50(2):154–61.

83. Ditlopo P, Blaauw D, Lagarde M. A Longitudinal Study of the Job Choices of a Cohort of South African Nurses to inform Human Resource Policy Interventions. 2016;

84. Statistics South Africa. Mid-year population estimates [Internet]. 2014 [cited 2015 May 10]. Available from: http://www.statssa.gov.za/publications/P0302/P03022014.pdf

85. South African Nursing Council(SANC). The list of public and private accredited nursing education institutions by province in South Africa. [Internet]. 2015 [cited 2015 May 10]. Available from: http://www.sanc.co.za/neis.htm

86. Wildschut A, Mgqolozana T. Shortage of Nurses in South Africa: Relative or Absolute? Department of Labour South Africa; 2008.

87. Benton DC, Shaffer FA. Human Resources for Health 2030 and the regulatory agenda. J Nurs Manag. 2016 Sep 1;24(6):705–7.

APPENDICES

Appendix 1: Primary study questionnaire

CREHS COHORT MINI FOLLOW-UP QUESTIONNAIRE 9 (January 2015)

STUDY NUMBER: *[studyid]*

PART 0: BACKGROUND INFORMATION

Name & surname of the respondent:	*[fu8_name] [fu8_surname]*
Cell number:	*[fu8_cphone]*
Alternative cell number:	*[fu8_altphone]*
Home number:	*[fu8_hphone]*
Alternative home number:	*[fu8_althphone]*
Status after last follow-up round:	*[status]*
Number of completed interviews:	*[fu8_nint]*
Date of last interview:	*[last_intv]*

NOTE: THIS SECTION SHOULD CAPTURE THE FINAL OUTCOME, NOT NECESSARILY THE NUMBER OF ATTEMPTS OF TRACING THE PARTICIPANT

i. **Were you able to contact participant directly?**

1. Yes *(skip to iii)*

2. No

ii.   Did you speak to someone from family or a friend?

1. Yes ⎤
⎬ *(skip to Q iv)*
2. No ⎦

iii.   Did you interview the participant?

1. Yes *(skip to Q1)*

2. No

iv.   What are the reasons for NOT   completing the interview?

1. Refused. Participant terminated ☐ participation
2. Unsuccessful. Not able to locate ☐
3. Participant died *(skip to Q v)* ☐
99 Other: specify: _____

v.   If participant died, when did this happen?

☐☐ **/** ☐☐ **/** ☐☐☐☐
   Day   Month   Year

PART 1: DEMOGRAPHIC QUESTIONS

> **In the last follow-up, you reported that:**
>
> - **You were *[fu8_marit]* and that**
> - **You had *[fu8_numkid]* children**

Q1. Are you still *[fu8_marit]*?

1. Yes *(skip to Q3)*

2. *No*

Q2. If not, what is your current marital status?

1. Single

2. Married ⟶ If married, when did you get married?

(or with long-term partner)

	/		/		
Day		Month		Year	

If divorced, when did your divorce happen?

3. Divorced/separated ⟶

	/		/		
Day		Month		Year	

If widowed, when did this happen?

	/		/		
Day		Month		Year	

4. Widowed ⟶

Q3. Did you have a child since January 2014?

1. Yes

2. *__No (skip to Q5)__*

Q4. If yes, what is the birthdate of your child?

	/		/		
Day		Month		Year	

PART 2: CURRENT JOB STATUS

> **In the last follow-up, you reported that:**
>
> - **You were working at [*fu8_f_name]* in [*fu8_prov]* province**

1. Yes *(skip to Q20)*

2. No

Q6. Why are you no longer working at [*fu8_f_name*]?

1. I am unemployed (***skip to Part 3C)***

2. I am on maternity leave   ***(skip to Part 3D)***

3. I am currently studying full-time (***skip to Part 3E)***

4. I am working somewhere else

99   Other: specify:

_____

Q7. In which province are you currently working?   (Circle   the appropriate box)

1.	Eastern Cape
2.	Free State
3.	Gauteng
4.	Kwa-Zulu Natal
5.	Limpopo
6.	Mpumalanga
7.	Northern Cape
8.	North West
9.	Western Cape

Q8. In which sector are you currently working? (Circle the correct response)

1. Public sector (run by provincial government)

2. Private for-profit sector (run by private sector)

3. Private not-for-profit/NGO (run by an NGO, a charity, a church)

Q9. In what type of facility are you currently working? (Circle the correct response)

1. Hospital   *(skip to Q10)*

2. Clinic   *(skip to Q11)*

3. Community Health Centre (CHC)   *(skip to Q12)*

99   Other   *(skip to Q13)*

Q10. What is the name of the hospital where you are currently working?

1. Hospital name _____ (fill in the number from the list)   *(skip to Q16)*

2. **Other: If the hospital is not on the list, complete the information below.**

Hospital   name: _____
   (skip to Q16)

Q11. What is the name of the clinic where you are currently working?

1. Clinic name:_____ (fill in the number from the list)   *(skip to Q16)*

2. **Other: If the clinic is not on the list, complete the information below.**

Clinic name: _____

(skip to Q16)

Q12. **What is the name of the community health centre (CHC) where you are currently working?**

        1. CHC name:_____ (fill in the number from the list)   *(skip to Q16)*

        2. **Other: If the community health centre is not on the list, complete the information below.**

CHC name: _____

  (skip to Q16)

Q13. **In what type of organisation are you currently working?**

1. Blood services

2. Lab services

3. Medical aid scheme

4. Research Unit

5. Teaching / academic institution

99   Other: _____

Q14. **What is the name of the organisation where you are currently working?**

_____

Q15. **In which town or city is your organisation located?**
_____

Q16. **How many times did you change jobs since the last interview (January 2014)?**

1. Once

2. More than once

Q17. When did you start working at _____ **(Mention name of the new current facility)?**

		/			/				

Day   Month   Year

Q18. Why did you leave [*fu8_f_name*]*?*

1. I was dissatisfied with the job

2. I wanted to earn a higher salary

3. I wanted to study further

4. Conflict with supervisor / difficult relationship with supervisor

99   Other (specify): _____

Q19. How would you describe the area in which _____ *(Mention the name of the facility where currently working) is located?*

1. Deep rural village

2. Rural village

3. Small town in a rural area

4. Small town in an urbanised area

5. Large town

6. City

In the last follow-up, you said that:

- **You were working as a [*fu8_level*]**

Q20. Are you still working as a [*fu8_level*]?

1. Yes   *(skip to Q23)*

2. No

Q21. If not, what is your current job title?

1. Professional Nurse

2. Senior Professional Nurse

3. Chief Professional Nurse

4. Nursing Manager

5. Facility Manager

6. Matron

7. Clinical Supervisor

8. Primary Health Care Nurse

9. Nurse Clinician

10. Advanced Midwife

11. Programme Manager

12. Lecturer / Nurse Educator

13. Case Manager

14. Research Coordinator

15. Occupational Health Nurse

16. Donor care facilitator

17. Facility Mentor

18. Nurse Mentor

19. Volunteer Worker

20. Enrolled Nurse

99. Other (specify): _____

Q22. When did you start your new position?   *(skip to Q23)*

		/			/				

Day	Month	Year

PART 3A: CURRENTLY EMPLOYED - WORKING CONDITIONS

Q23. How many hours per week do you work in your main job?

_____

Q24. What was your basic take home salary from your main job last month?

_____

Q25. Did you do any moonlighting or agency nursing last month?

1. Yes

2. No   *(skip to Q27)*

Q26. If yes, how much did you earn from moonlighting or agency nursing (after tax) last month?

_____

Q27. How would you describe your workload?

1. Too heavy - I have too much to do and generally don't complete my tasks in working hours

2. Heavy – I have a lot to do, but generally completely my tasks in working hours

3. Moderate – I am quite busy, but I generally have some spare time during working hours

4. Light – I am not that busy and generally I have a lot of spare time during working hours

Q28. On a scale of 1 to 10 (1 being very dissatisfied and 10 being very satisfied), how satisfied are you with each of the following aspects of your job:

a) Your job in general   1 2 3 4 5 6 7 8 9 10

b) Your working conditions   1 2 3 4 5 6 7 8 9 10

c) Your supervisor   1 2 3 4 5 6 7 8 9 10

d) Your relationship with colleagues   1 2 3 4 5 6 7 8 9 10

e) Your salary   1 2 3 4 5 6 7 8 9 10

Q29. What is the gender of your main supervisor?

1. Male

2. Female

Q30. In your role as a *[fu8_level],* do you manage any clinical staff?

1. Yes

2. No   *(skip to Q32)*

Q31. If yes, how many clinical staff reports to you?   _____

Q32. In your role as a *[fu8_level],* do you manage any support staff?

1. Yes

2. No   *(skip to Q34)*

Q33. If yes, how many support staff reports to you?   _____

Q34. Do you see yourself working in *[fu8_f_name]* for the rest of this year (2015)?

1. Yes, most certainly

   (skip to Q37)

2. Yes, probably

3. Don't know yet

4. No, probably not

5. No, definitely not

Q35. If you will not be working in *[fu8_f_name]* for the rest of the year, do you already have another job organised?

1. Yes

2. No   *(skip to Q37)*

Q36. What is the name of the facility where you will be working in 2015?

_____

PART 3B: CURRENTLY WORKING AS A FRONTLINE / BEDSIDE NURSE

Q37. Are you currently working as a clinical nurse directly involved with patient care?

1. Yes

2. No   *(skip to Part 4)*

Q38. Have you worked on night-duty in the last month?

1. Yes

2. No   *(skip to Q40)*

Q39. How many nights of night-duty have you worked in the last month?

_____

Q40. In the past month, how often were you unable to do your job properly because of lack of drugs/medicine?

1. Never

2. Very seldom

3. Seldom

4. Frequently

5. Very frequently

Q41. In the past month, how often were you unable to do your job properly because of lack of adequate equipment?

1. Never

2. Very seldom

3. Seldom

4. Frequently

5. Very frequently

	Strongly Disagree	Disagree	Neither Agree/ Disagree/	Agree	Strongly Agree
a. My supervisor treats me with kindness and consideration	1	2	3	4	5
b. My supervisor shows me concern for my rights as an employee	1	2	3	4	5
c. We have a 'we are together' attitude	1	2	3	4	5
d. People keep each other informed about work related issues in the work unit	1	2	3	4	5
e. People feel understood and accepted by each other	1	2	3	4	5

f. Members of the work environment build on each other's ideas in order to achieve the best possible outcome	1	2	3	4	5
g. People in the work unit cooperate in order to help develop and apply new ideas	1	2	3	4	5
h. I can trust my supervisor	1	2	3	4	5

Q42. To what extent do you agree or disagree with the following statements about the nature of relationships in your workplace?

Q43. To what extent do you agree or disagree with the following statements about your job?

	Strongly Disagree	Disagree	Neither Agree/ Disagree	Agree	Strongly Agree
1. I often think about leaving this job	1	2	3	4	5
2. I do not intend to leave my current job	1	2	3	4	5
3. I will probably look for a job at a new facility or organisation in the next 12 months	1	2	3	4	5
4. As soon as I can find another job, I will leave this job.	1	2	3	4	5
5. If I leave my current job, I would want to stay in the public sector	1	2	3	4	5

(SKIP TO PART 4)

PART 3C: CURRENTLY UNEMPLOYED

Q44. If currently unemployed, when did you stop working?

	/		/		
Day		Month		Year	

Q45. Did you choose to be unemployed?

1. Yes

2. No

Q46. Have you looked for a job in the last month?

1. Yes

2. No

(SKIP TO PART 4)

PART 3D: CURRENT ON MATERNITY LEAVE

Q47. If currently on maternity leave, when did you start your maternity leave?

	/		/		
Day		Month		Year	

Q48. When will your maternity leave end?

	/		/		
Day		Month		Year	

Q49. Do you plan to go back to the same facility after the maternity leave?

1. Yes *(skip to Part 4)*

2. No

Q50. If you will not be going back to the same facility, do you already have another job organised?

1. Yes

2. No *(skip to Part 4)*

Q51. What is the name of the facility where you will be working after your maternity leave? *(skip to Part 4)*

_____

_____

PART 3E: CURRENTLY STUDYING

Q52. When did you start with your full-time studies?

		/			/				
Day			Month			Year			

PART 4: SPECIALISATION

Q53. When did you complete *[fu8_spec1_m]*?

	/		/		
Day		Month		Year	

Q54. How long was *[fu8_spec1_m]*?

1. 6-months

2. 1 year

3. More than 1 year

Q55. When did you complete *[fu8_spec2_m]*?

☐☐ / ☐☐ / ☐☐☐☐
Day   Month   Year

Q56. How long was *[fu8_spec2_m]*?

1. 6-months

2. 1 year

3. More than 1 year

Q57. Have you since completed your nursing specialisation in *[fu8_spec1_o]*?

1. Yes

2. No   *(Skip to Q60 if [fu8_spec2_o] exists, otherwise Skip to Q66)*

Q58. When did you complete *[fu8_spec1_o]*?

☐☐ / ☐☐ / ☐☐☐☐
Day   Month   Year

Q59. How long was *[fu8_spec1_o]*?

1. 6-months

2. 1 year

3. More than 1 year

Q60. Have you since completed your nursing specialisation in *[fu8_spec2_o]*?

1. Yes

2. No   *(Skip to Q63 if [fu8_spec3_o] exists, otherwise Skip to Q66)*

Q61. When did you complete [fu8_spec2_o]?

☐☐ / ☐☐ / ☐☐☐☐
Day   Month   Year

Q62. How long was [fu8_spec2_o]?

1. 6-months

2. 1 year

3. More than 1 year

Q63. Have you since completed your nursing specialisation in [fu8_spec3_o]?

1. Yes

2. No   *(skip to Q66)*

Q64. When did you complete [fu8_spec3_o]?

☐☐ / ☐☐ / ☐☐☐☐
Day   Month   Year

Q65. How long was [fu8_spec3_o]?

1. 6-months

2. 1 year

3. More than 1 year

Q66. Are you currently enrolled for any other nursing speciality?

1. Yes

2. No   *(skip to Part 5)*

Q67. Which nursing speciality are you currently studying?

1. Nursing speciality number: _____ *(fill in the number from list)*

If the speciality is not on the list, please write it in the space below.

2. Nursing specialty name: _____

Q68. How long is your course?

1. 6-months

2. 1 year

3. More than 1 year

Part 5: Contact Detail Verification

WE WOULD LIKE TO VERIFY THE CONTACT DETAILS THAT YOU GAVE US IN THE LAST YEAR TO CHECK IF THEY HAD NOT CHANGED.

Postal address:	*[fu8_address]*
Home phone number:	*[fu8_hphone]*
Work phone number:	*[phone]*
Cell phone number:	*[fu8_cphone]*
Email address:	*[fu8_email]*
Alternative postal address (self):	*[fu8_altaddress]*
Alternative home phone number (self):	*[fu8_althphone]*
Alternative cell phone number (self):	*[fu8_altcphone]*
Alternative email address (self):	*[fu8_altemail]*
Parents names:	*[fu8_parent]*
Parents' postal address:	*[fu8_paraddress]*
Parents' home phone number:	*[fu8_parhphone]*
Parents' cell phone number:	*[fu8_parcphone]*
Parents' email address:	*[fu8_paremail]*
Spouse or Partner's name:	*[fu8_spouse]*
Spouse or Partner's postal address:	*[fu8_spoaddress]*
Spouse or Partner's home phone number:	*[fu8_spohphone]*
Spouse or Partner's cell phone number:	*[fu8_spocphone]*
Spouse or Partner's email address:	*[fu8_spoemail]*
Best friend's name:	*[fu8_friend]*
Best friend's postal address:	*[fu8_friaddress]*
Best friend's home phone number:	*[fu8_frihphone]*
Best friend's cell phone number:	*[fu8_fricphone]*
Best friend's email address:	*[fu8_friemail]*

Appendix 2: Ethics clearance certificate

R14/49 Dr Debrah Vambe

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M160642

NAME:
(Principal Investigator)
Dr Debrah Vambe

DEPARTMENT:
School of Public Health

PROJECT TITLE:
Comparing the Job Location Choices of University - Trained and College-Trained Professional Nurses in South Africa

DATE CONSIDERED:
24/06/2016

DECISION:
Approved unconditionally

CONDITIONS:

SUPERVISOR:
Duane Blaauw

APPROVED BY:
Professor P Cleaton-Jones, Chairperson, HREC (Medical)

DATE OF APPROVAL:
08/08/2016

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary in Room 10004, 10th floor, Senate House/2nd Floor, Phillip Tobias Building, Parktown, University of the Witwatersrand.
I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report**. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed in June and will therefore be due in the month of June each year.

Principal Investigator Signature   Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES