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Research Article

A STRATEGY FOR TRAINING PRE-SERVICE COMPETENT NURSES USING APPROPRIATE COURSE SEQUENCING IN THE NORTH WEST REGION OF CAMEROON

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Abstract

Purpose: To analyse views of students in their training using appropriate sequencing, to investigate the views of nurse educators and other stakeholder for the training of pre-service competent nurse using appropriate sequencing, to analyse uptake measures and develop strategies for training pre-service competent nurse. **Method:** A mixed research methodology was used and qualitative data was collected using interviews. A cross sectional design was used to collect Quantitative data using questionnaires systematically from a sample of 381 students' stakeholders 1, conservatively from 24 nurse educators' stakeholders 2, purposively from 27 other stakeholders (policy makers, head of nursing association, head of departments, directors of nursing institutions, using a multistage sampling approach. Quantitative data was analysed using SPSS version 10.5, qualitative data from interview transcripts were analysed through NVIVO 9. **Findings:** Majority students viewed that there was inequitable time between theory and practice as the time allocated for theoretical courses is very long such that students do not have much time to practice in clinical sites immediately after they finish each course. The differences in terms of perfect match between theoretical courses and clinical courses was statistically significant (P=0.028). Most students (42.9%) view that there is inadequate sequencing of courses as some courses in the course content were to be taught before others were not, and some which were supposed to be in the training program were left out. For the course content, the difference in students' views was statistically significant (P=0.002). Findings from nurse educators' views revealed that there is some content lacking in the training syllabus that ought to be there and this was statistically significant with (P=0.049).Most of the nurse educators (50%) viewed limited sequencing of courses in the program as they sometimes decide to teach a particular content before another even though it has been arranged differently in the content. Student nurses being well grounded in theory (memorizing large volume before going for clinical experience was statistically significant (P = 0.031). Mostother stakeholders (directors, managers, head of departments of nursing schools,) view that there are some practical demonstration courses are lacking in the training programand student have longer periods of theory before internship. Most stakeholders 50% viewed that there was no nurse autonomy to influence course sequencing in the training program.

Keywords: Strategies, Training, course sequencing stakeholders, Nurse educators' stakeholders, Pre-service competent nurse, North West Region of Cameroon.

INTRODUCTION

An important aspect of nursing education is to impact clinical skills to student nurses to ensure patient safety. It is a challenge for the nursing educators to develop innovative methods for impacting clinical skills to student nurses in order to ensure competency at the bedside. Nursing education plays an important role in achieving the desired results in terms of producing competent nurse professionals. Training with appropriate sequencing is an essential factor contributing to greater efficiency of students. The competency level of nurses is based on the knowledge acquired by them during their training and to a large extent on the skills taught to them. Sequencing of courses such that theory is immediately followed by clinical practice is important. Learning in the clinical practice environment is an important aspect of nursing education considering the fact that nursing profession is based on practice [1]. Course sequence is relevant as it prepares nurses to become competent nurse practitioners. Studies have revealed that effective and maximum learning takes place when courses are sequenced. Strategies should be developed in order to sequence courses, and in addition create a conducive clinical learning environment. Course sequence remains an important aspect in the development of students' competence, confidence and contentment of their expected learning outcomes. Teachers play a significant role in preparing students to achieve their professional goals through continuous support and resource provision [2]

Studies carried out, such as the assessments of nursing education programmes conducted by WHO and other partners, between 2008 – 2013, revealed that great variations exist among countries and especially among francophones, Anglophones and Lusophone countries with regard to training program orientations. Variations include, limited comprehensive written formal and approved training program documents which should guide implementation of planned learning experiences, names of diplomas and content areas; lack of balance between theory and practice including absence of clinical courses and related clinical competencies to link theory with practice; no clear linkages between content and programme objectives/ learning outcomes and lack/complete absence of relevant and current training materials in most educational institutions. [3].
Improving the quality of nursing education and training of pre-service competent nurse through course sequencing, is an important way of strengthening health systems. In today's rapidly changing era, the focus of nursing education is to move towards high level quality education through course sequencing along with other significant contributors like competent teachers and learning environment [4].

Course sequencing is the efficient ordering of the content in order to improve the learners' understanding, and help them achieve the objectives. This can be achieved at various levels ranging from program level to a single course level [5]. To ensure sequencing in all components of the course, the process incorporates certain variables such as level of course/ course objectives, and emphasis on content [6].

These concerns about course sequencing in nursing education programmes in the training of pre-service competent nurse, amongst other factors can cause a theory practice gap. Studies have shown that the practice by graduate nurses is not evidence based, which results in a variety of techniques being used without fully rationalising their practice [7]. This scenario can leave students unsure of which method they should use as often what they are taught in university is not being reflected by their mentors in clinical practice. This results in a theory-practice gap. The theory-practice gap is a participant that arises in such a circumstance when medical professionals seek to integrate student knowledge with real practical activities actively. This "break" is a kind of universal problem in the field of healthcare and nursing [8]. According to research, a potential breakup usually leads to cognitive dissonance or moral disorders [7]. Moreover, as standards of practice and medical care are in continuous development and improvement, it may seem that there is a gap between best and actual, current practice. This hurts nurses training it may reflect poor-quality service and patient care. As a strategy to address these shortcomings, the World health organization in 2009, 2013, and 2015 develop a three-year regional prototype for pre-service training of competent nurses. It recommended the adoption of and implementation of an adaptable competency-based program, to educate competent nursing graduates for the 21st century. The rationale was that a competency program will close the theory practice gap [9]. Following the recommendations by WHO in 2013 for transforming and upscaling the education and training of nurse for an improved population health outcome, countries are reporting efforts to transform the education and the training of nurses. Despise the development of the three-year regional prototype, disparities continue among countries with regards to its implementation. This has led to the existence of a theory practice gap among graduate nurses. As a logical consequence, there is need for an appropriate course content sequencing as part of a strategy for training pre-service competent nurses in the North West Region of Cameroon.

1.1 Background

Nurse education consists of the theoretical and practical training provided to nurses with the purpose to prepare them for their duties as nursing care professionals. This education is provided to student nurses by nurse educators who have qualified experience for educational tasks. Courses leading to autonomous registration as a nurse typically last four years [10]. To meet both requirements, nurse education aims to develop a lifelong learner who can adapt effectively to changes in both the theory and practice of nursing. Several World Health Assembly resolutions on strengthening nursing and midwifery services have been passed, the most recent being WHA 64.7, 2011 which calls for WHO Member States to collaborate:" within their regions and with the nursing and midwifery professions in the strengthening of national or sub national legislation and regulatory processes that govern professions, including the development of competencies for the educational and technical preparation of nurses and midwives , and systems for sustaining those competencies; and giving consideration to the development of the continuum of education that is necessary for attaining the required level of expertise of nurse and midwifery researchers, educators and administrators. These regional prototype program for nursing and midwifery education and training are, in part, a step towards creating a means for implementing the World Health Assembly (WHA) resolutions (the most recent being WHA 64.7, 2011) of regional interest and the global and regional strategic directions on strengthening the contribution of nursing and midwifery to the development of health systems. The program is also consistent with the "Roadmap for scaling up the Human resources for Health (HRH) for improved health service delivery in the African region 2012-2025" adopted at the 62nd Session of the Regional Committee for African Health Ministers held in 2012. The strategic areas in the WHO road map is builds upon a number of national, sub regional, regional and global efforts. It has the following strategic areas for achieving nurse training objectives. Strengthening nursing workforce leadership and governance capacity. Strengthening HRH regulatory capacity. Scaling up education and training of nurses. That means making training an active, collaborative mode of learning, which is student centred and offers an alternative to didactic and discursive pedagogies like lectures and seminars. Optimizing the utilization, retention and performance of the active nursing workforce.

According to [11] a strong health workforce is the backbone of a well-functioning health system. According to [11], the education, recruitment, deployment and retention of nurses, remain major challenges for many training systems, especially those of the six African Regions: North Africa, West Africa, Central Africa, East Africa, Southern Africa, including Cameroon which is in the West-Central Africa. These challenges especially training of competent nurses which is not in line with the three years regional prototype such as limited course content sequencing, have some negative impact on the quality of health services graduates and, consequently, on the health of a given population as health coverage is greatly compromised. Weak leadership and governance of Human Resource Health (HRH): According to WHO regional committee for health, there are imbalances between the supply and demand of health workers, efforts are largely uncoordinated, and competition within and across sectors is counter-productive. The lack of a holistic and comprehensive approach to various aspects of HRH such as policy, planning, financing, education, recruitment, HRH management systems, and partnerships among private and public entities is a direct consequence of weak HRH governance capacity. Furthermore, there is a high turnover of policy-makers and high-level professionals in countries, which undermines continuity of policy direction and implementation oversight. Strengthening the overall governance capacity of HRH is essential to improving the availability and performance of the nursing workforce including their recruitment, deployment, monitoring and evaluation. WHO put in place Strategies for scaling up education and training of nurse workers? Increase educational capacity to scale up the production of health workers to match demand (infrastructure, laboratory work environment, teaching staff, teaching equipment and materials). Increase the production of nurse workers taking into account skill mix

requirements to improve the quality of service delivery and patient care. Strengthen and/or introduce innovative approaches such as the sequencing of courses and the training program professional education in pre-service education and continuing professional development. Develop national accreditation systems with sub regional, regional and global facilitation for all nursing professional institutions. Increase access to training resources and materials for education and development through establishing and promoting sustainable mechanisms such as the programme for textbooks, instructional materials and diagnostic equipment for health sciences education in the African Region. Expand and strengthen service platforms for professional education, training and research. Promote and facilitate the sharing of education and training capacity across the Region. Promote and facilitate the harmonization of curricula, education standards, accreditation, and professional regulation. Strengthen and accelerate the training and career progression of teaching nursing staff and introduce measures to ensure their retention.

Also, to address these challenges World Health Organization developed the three-year regional prototype competency-based program which required course content sequencing, improved teaching and learning and an organizational environment conducive to academic achievement and to the professional and personal development of students enrolled in pre-service nurse education programs [11]. Graduates are prepared to practise according to professional practice and ethical standards and have achieved the competencies required for the pre-service nurse or midwife, or to practise in a speciality role as defined by the national regulatory body or other appropriate body.

According to [12] nursing education is the foundation of a qualified and competent nursing workforce. Improving the quality of nursing and midwifery education is an important way of strengthening the health system. This is approached principally by establishing standards for professional education, assuring quality educational processes and nursing institutions, and accrediting nursing institutions offering educational programmes for pre-service nurse. The World Health Organization (WHO) established the first regional education standards in nursing and midwifery in 1998 [13]. Since then, these standards, supported by prototype program for nursing at the technical and professional levels, have been used across the WHO Eastern Mediterranean Region as nursing education has grown and advanced. More recently, according to, [14] published standards for the initial education of professional nurses and midwives. These standards take into account the concepts and directions provided by the global standards.
WHO says in many other parts of the world, there is growing concern about the fitness of health professionals graduating from educational nursing institutions to provide quality professional services, and about the capacity of educational programmes to graduate nurses with the right set of competencies, and with the ethical and professional values expected of them. Fifteen years after the first nursing education standards were applied in the Region, WHO and other partners considered it timely to revisit them, to review and revise the prototype program for nursing. The International Council of Nurses defines a standard as the desirable and achievable level of performance against which actual practice is compared. WHO believes that educational standards should serve to: promote the progressive nature of education and lifelong learning and ensure the employment of practitioners who are competent and who, by providing quality care, promote positive health outcomes in the populations they serve. According to WHO, 2016, in spite of this, most training programmes in in the African regions including Cameroon continue to run without adequate course sequencing. There also continues to be a gap between theory and practice amongst nursing graduates. Also, that health systems in most African countries and Cameroon rely on nurses who comprise more than 50% of the health workforce and provide up to 90% of services in Cameroon, Nigeria and other African countries [15]. There is therefore, need to have courses sequenced to produce a well-trained competent nursing work force, as there continue to be a theory practice gap in nursing graduates due to inadequate course sequence among other factors. Nurses form a critical part of the human resources for health in Africa; they function at all levels of care [16]. The cost implications of training this cadre of health workers and their utilization are often debated by health system operators who attempt to lower costs by using lower categories of health workers [17]. However, it must be recognized that health systems are labour-intensive. Consequently, and in line with advances in technology, complex health problems require well-educated and experienced, competent nurses with competencies to adequately meet the health needs of the population [18]. The education of competent pre-service nurses through appropriate course content sequencing, among other things is therefore critical [19].

Education and training of nurses in Africa vary widely in approaches such as objective based approach, content driven approach or competency-based approach, and level of training [19] as in Cameroon and some countries, graduates exit with dual qualifications such as nursing and midwifery or nursing and public health; in other countries they exit with a single qualification as nurses or midwives. Some concerns have been raised about nursing and midwifery education programmes and these include inconsistency in the quality of education programmes; no sequencing of courses in some nursing institutions, fragmented nature of program; content-driven rather than competency-based program; content poorly aligned to the needs of the health-care system [19].
Pre-service nursing education refers to training that takes place in educational nursing institutions. Related to competency-based education and training, pre-service training programs aim to provide students with the opportunity to acquire relevant competences (knowledge and skills) and professional attributes by the time they graduate from an educational institution. Thereafter, they are expected to translate that learning into a demonstration of competence. To improve global health, WHO aims to advance health equity both within and between countries in the best interest of health workers, country, government and the population served. A global framework for professional nursing education and the policy implications in guiding the harmonization of nursing education that was demanded by State of the World's Nursing, [20] was a call to action. Globally, 91% of countries report that standards for duration and content of nursing education exist. 89% of these countries indicate that they possess accreditation from nurse education institutions [21]. According to [22], considerable variation persists in the level and quality of education for registered nurses within the six World Health Organization (WHO) region and African countries including Cameroon. Moreover, variation exists within a single country [23]. According to WHO current complexity of training demands that nursing education responds to a shift to higher levels of decision making, clinical judgement, team leadership, and political acumen enabling nurses

to manage care in complex environments and across training and social sector boundaries. In addition, nurses are an increasingly mobile workforce with one in eight not practicing in the country where they were born or educated [24]. Thus, there is an urgent international need for high-quality guidelines to direct nursing education. There are more people over 60 years than children under five years worldwide. These has been associated with a global increase in the prevalence of non-communicable chronic illnesses, communicable diseases, including the current COVID-19 pandemic. In addition, population mobility, armed conflict, and climate change are creating major health crises worldwide [25]. Governments in several countries have undertaken measures to improve health services by enhancing the quality of nursing education.

The global challenge facing nursing education programs resides in delivering transformed undergraduate program such as course content sequencing and practice learning opportunities to meet the new paradigms emerging in healthcare. In response to these demands, an international trend in nursing education has been a shift from vocational training to evidenced-based education [26]. Although some countries continue to provide only vocational training for nurses, an increasing number have instituted the baccalaureate degree as an entry-to-practice requirement for registered nurses [27]. For example, China has three entry levels for registered nurses - diploma, advanced diploma, and baccalaureate degree. Chinese policy and regulations recognize that high standards of nursing education are essential to meet the health demands of the population and the numbers of baccalaureate prepared nurses and nurses with graduate degrees have therefore increased [28]. The evolution of nurse education in Cameroon, is very important to this study [29]. The background of nursing education in Cameroon is aimed at giving the reader an appreciation of the research context. The history reported here is aimed at nurse education though some aspects overlap with the history of the profession in Cameroon. Adopted at reunification, as reported by [29] was a federal system with a rare type of powerful presidency he described as “a hybrid president who combined the attributes of a British style governor-general, a Fifth Republic French president and an American chief executive”. He noted that this type of presidency did not appear to have had any parallels at the time or in past constitutional practice. This sort of presidency reflected the desire by some for a strong centralised executive that controlled all powers. Eventually the federal system was abolished in 1972 and a unitary state created. This phase of the political birth of the country is important as it had potential to influence the development of the nursing professions. In the course of this study an understanding of this political history might be necessary to understand nurse educational evolution in the country. Before ‘modern’ nursing by Florence Nightingale during the colonial era, the care of patients in different tribes and villages were in the hands of ‘medicine men and women’. These people who still exist are believed to possess spiritual powers and deep knowledge of herbs and other rituals and their role in diagnosing and treating both physical and spiritual ailments. This ‘traditional medicine’ is believed to have components that could be taught through apprenticeship and others that could only be transferred to a successor spiritually following instructions from the ancestors. Problems of fertility and pregnancy were managed by the traditional doctors, while issues of delivery and postpartum care were handled by traditional birth attendants (TBAs) who were usually elderly women. The TBA received no formal training and no model or training program for training nurses existed. They may have learned by apprenticeship. They provided care for the mother and neonate, advised on nutrition, hygiene and also carried out circumcision. These womenwere also known to treat common childhood diseases and even complex conditions like umbilical hernia through traditional methods. The responsibility of caring for sick persons was usually in the hands of their relatives who were usually guided by the native doctor. This family involvement in care has continued today with hospitals always crowded by patient relatives actively taking over some nursing roles in the care of the patients.

In this era the profession of nursing did not exist in Cameroon until the arrival of the missionaries and colonialists in the late 19th century. This was similar to the experience of other countries for example China, where modern nursing according to, Watt evolved due to the influence of Western missionaries. In Brazil and other Latin American countries, until the 19th century, family members, healers, and practical midwives were the primary sources of health and illness care in the home while religious, custodial, and philanthropic organizations delivered training in the major cities [30].Thus it can be assumed that while elements of the role of the modern day physician and midwife can be traced back to medicine men and TBAs respectively, the ‘nurse’ figure was not so apparent as nursing roles were carried out by the TBAs, medicine men and family members. [31] stated that Chinese nursing ethos reflects the underlying beliefs of Chinese people and their cultural understanding of health, with a traditional Chinese saying that 30% of healing depends on treatment and 70% on nursing care [32]. So, the link between man, his environment and disease have cultural undertones the Chinese people can recognise. This perception is not very different from the philosophies advanced by modern nursing theorists from orientation to fundamental human needs and assisting individuals to meet this need [33] through the Neuman systems model [34] to the assistance of individuals in activities of daily living [35]. Nursing philosophy in Cameroon as taught in schools and applied in practice is based on these nursing theorists. For example, Virginia Henderson, the theory of fundamental human needs and assisting individuals to meet this needs, Roper Logan, the theory of assisting individuals in activities of daily living and Neuman and Facet in the Neuman system model. The points for reflection here will be on whether and how traditional philosophies have influenced nursing education and practice (probably in subtle and imperceptible ways). It might be unreasonable to say there are no such similarities or links, fundamentally because illness, treatment and care existed even before nursing was introduced to the country. If that is the participants then it is necessary to assess to what level or extent these have found their way into nursing education design, planning and execution. The fact that nursing professionals and students quickly revert to the philosophies of nursing as propagated by modern theorists might not necessarily imply that there is no existing traditional ‘philosophy of nursing’. Nurse education in Cameroon can be traced back to the start of the colonial era. When the Germans annexed Cameroon in 1884, they trained a type of medical personnel called ‘Dressers’ [36]. A dresser was a surgeon’s assistant or ‘some sort of male nurse’ whose duty was to dress wounds and sores [37]. There is virtually no local literature on what this training entailed and what the role of the dressers were in the training system. The Germans were followed by the French and the British who partitioned Cameroon between them after World War1 (WWI).

In 1930, Dr Eugene Jamot, [38], opened the first school to train nurse aides in the French part of the country. The training lasted three months and these graduates helped him in his fight against sleeping sickness. [39], the training evolved to health assistants who were trained for three years and performed both medical and nursing roles. These health technicians were therefore not described as nurses. Kamta goes on to add that it was in 1959 that a formal training program based on the French model was introduced. The British Cameroons [36] reported that after the Germans left, the British continued using the of dressers when they opened the African hospital in Victoria by 1933. During this time training for nurses was only available in Nigeria and since the British managed their territory as part of Nigeria it was easy for Cameroonians to study in Nigeria. The National Observatory for Human Resources for Health Cameroon NOHRHC [38] reported that the first training school services in this part of the country was started by the Catholic mission in 1954 at Shisong Shisong school of health.

The School of Health prepares Nursing, Midwifery and Laboratory students for professional holistic health care practice, faithful service and ethical leadership as professionals who will advance high standards of the practice in society. Faculty create an educational experience that embraces the pursuit of wisdom and the values of caring, integrity, collegiality, and commitment as preparation for a dynamic health care environment. Shisong Catholic School of Health Science trains health personnel since 1952. Today it offers the following programs: State Registered Nursing: 3 years, Laboratory Technicians: 3 years, Midwifery (new): 3 years, nurse Assistance: 1 year. Catholic School of Health Sciences Shisong (CSHS) is an arena for tertiary education located in Shisong, Bui Division, North West Region of Cameroon. It serves as the Teaching Arm of St. Elizabeth Catholic General Hospital Shisong. It was founded in 1954 by the Tertiary Sisters of St. Francis. The Catholic School of Health Sciences is authorized to function by the Ministry of Public Health. CSHS prepares students to be well-rounded leaders and critical thinkers who make a positive impact on the world. The training program was a formal and they also train laboratory technicians. Later the midwifery school was created. These schools were all hospital based as there was no university-based programme at the time. All the nursing programmes at this time were under the Ministry of Public Health. Graduate education in Cameroon has mostly remained inaccessible to the majority of diploma nurses.

According to National Observatory for Human Resources for Health Cameroon NOHRHC, the University of Buea (Cameroon's lone Anglo-Saxon state university at the time) in 1997, began a four-year training programme for the award of a Bachelor's degree in Nursing Science (BNS). The first batch of graduates left in 2001 and were mostly nurses who had previously held diplomas. It must be noted here that the duration of training was the same for both diploma holding nurses and candidates without any nursing background i.e. fresh from high school. The university conferred its first Masters degrees in Nursing Education in 2009, and does not offer any doctoral degrees. According to the National Observatory for Human Resources for Health Cameroon NOHRHC, the University of Yaoundé I, which is the oldest in Cameroon also started a Master in Nursing Science degree in the late 2000s. Entry into practice is still based on the three-year diploma which can now be obtained from both the ministries of Public Health and Higher Education. Preregistration diploma programmes also continued even as undergraduate programmes are now available. However, the pathway to upgrade preregistration and registration diplomas to bachelor degrees is murky. According to Wilensky [40], in Baird and Szczygiel, early training schools and apprentice opportunities were created with the eventual transformation of their programs into university programs. Secondly local associations like the nurse and laboratory technician association in Bamenda, association of midwives and national associations, the Cameroon Nurses Association were established. Lastly state licensures were established and internal codes of ethics developed and adopted [41].

According to National Observatory for Human Resources for Health Cameroon NOHRHC, in the domain of education there has been significant increase in both the level and demand for nursing education over the past decade. The number of public and private nursing schools has increased geometrically and so has the number of candidates seeking admission into nursing schools. This may be evidence of recognition and acknowledgement of the profession by member09Us of the public who choose to register as students, sponsor students and demand the services of more nurses. Nurses and all other stakeholders agree that a nurse must receive formal education from a recognized or accredited institution before he/she can be allowed to practice. Thus, from this standpoint, nursing in Cameroon has met the criteria of professions. However, the type, structure, levels and variations of that education are other issues that need further exploration and synthesis if we need competent pre-service nurses.

According to the National Observatory for Human Resource for Health Cameroon, when Southern Cameroon was colonised by Britain it was administered as part of Eastern Nigeria. Most Southern Cameroonians were educated in Nigerian colonial institutions and Southern Cameroon politicians were represented in the Nigerian eastern regional house of assembly. When the region got its independence by reunification with East Cameroon in 1961, the West Cameroon Nursing and Midwifery Council was created. This body was responsible for the recruitment of candidates into nursing schools; supervised nursing programmes and examinations; vetted the end of course certificates; and issued authorisations to practice. These were necessary to ensure quality training of competent pre-service nurses. Sadly, according to the National Observatory for Human Resources for Health Cameroon NOHRHC, when the Federal State of Cameroon was dissolved in 1972 in favour of a unitary state, the role of this body was put in jeopardy as their regulating function was taken over by the government. Also, this period was the only time in the history of nursing in Cameroon that there was a visible professional body regulating the training and practice of nursing. National Observatory for Human Resources for Health Cameroon NOHRHC stated that, there also existed the Cameroon Nursing Society, a non-governmental organisation that received official authorization on the 7th of January 1992. Since its creation, it has been struggling to gain admission to the International Council of Nurses and currently has an observer status in the said Council. This association registers all nurses but places those with preregistration diplomas in the category of "associate members". A similar association in terms of membership structure is the Cameroon Nursing Association. These two groups periodically organise conferences for nurses during which professional issues are discussed and resolutions taken. The existence of these associations

gives a semblance of autonomy for the nursing profession but a crucial weakness is the fact that none of them has the authority to regulate nursing in Cameroon. A typical regulatory body sets and supervises the application of standards from student recruitment through training and entry into practice right through to demonstration of continuing competence of its members. According to the Higher Education Better Regulation Group in 2011, a regulatory body is one that sets the benchmark standards of entry, and is authorised to accredit programmes leading to professional qualifications in a particular profession. Such bodies play three roles: they safeguard the public interest which gives them their legitimacy; represent the interest of practitioners (acting as trade unions or as a learned group advancing continuing professional development); and maintaining their privileged and powerful position as a controlling body [42]. None of these groups have attained such a role in Cameroon especially when it comes to regulating and controlling nurse education training and practice, by ensuring that innovations such as course sequencing are implemented in the training program. There also exists the Cameroon national syndicate for nurses which operates as a trade union and lobbies for the interest of nurses. There are equally many other professional nursing associations for different professional levels (e.g. Association of Nurse Educators Cameroon, and many Nursing Alumni Associations) with different goals and objectives.

According to National Observatory for Human Resource for Health Cameroon, the Ministry of Public Health was the first provider of nurse education in Cameroon before being joined by the Ministries of Higher Education and that of Employment & Vocational Training in the late-1990s and mid-2000s respectively. The ministries of Public Health and Vocational Training can only issue diplomas by law while the ministry of higher education can issue both diplomas and degrees. The current structure of nursing programmes is presented below. the major elements of nurses training are; Preregistration diplomas, registration diplomas/ degree and post-registration diplomas/degree. For pre-registration diplomas, for assistant nursing or enrolled nurses the entering qualification is ordinary level certificate with a pass in four papers. The duration for training is one year for assistant nurses run by the Ministry of Public Health with some under the Ministry of Employment and Vocational Training. For enrolled nurses is 2 years of studies, previously their training was managed by the Ministry of Public Health which stopped running the programme in the early 2000s. presently it is under the Ministry of Employment and Vocational Training. Graduates exist assistant nurse certificates upon completion

For Registration diplomas/degrees, entering qualification is advanced level certificate with 2 papers with at least one science subject or Baccalaureate with at least one science subject. The duration of training is three years. Graduates exist with a State Registered Nurses certificate issued by the Ministry of Public other graduates exist Higher National Diploma nurses HND certificate, issued by the Ministry of Higher Education. for Bachelor degree nurses, duration of training is four years and graduates exist with a Bachelor of science in nursing or midwifery certificate issued by the Ministry of Higher Education. For post-registration diplomas/degrees, the requirement is that a nurse must have a diploma certificates and must have worked for two years before specialization in any of the discipline. For state certified paediatric nurses, duration is two years issued by the Ministry of Public Health. State Certified Nurse-Midwives duration is two years issued by the Ministry of Public Health. Since 2011 the training of midwives began separately from nursing. Students no longer needed to complete the three-year diploma programme before going into midwifery for two-year post registration diploma. State certified reproductive health nurse, duration is 2years of studies and issued by Ministry of Public Health. State Certified Mental Health Nurses, Nurse Anaesthetists and Nurse Ophthalmologists, duration is 2years of studies issued by the Ministry of Public Health. Geriatric nurses, duration is one 1 year of study issued by the Ministry of Employment and Vocational Training. Ministry of Public Health launched its own training in 2015. For masters in Nursing or midwifery, the entering requirement is first degree in nursing or midwifery. Duration is 2 years of studies issued by the Ministry of Higher Education. Postgraduates PhD in nursing, entering requirement is a master in nursing or midwifery, duration is 3 years issued by the ministry of Higher education. The above structure may probably confound anybody coming from another country with fewer key players. It has also made it challenging for international credential evaluation agencies trying to evaluate nursing certificates from Cameroon. Looking at these structures, there are challenges in the training programs**.**

In spite of the challenges to training and recruitment of nurses, the profession has still continued growing as evidenced by a number of facts including: The number of nursing schools has been steadily increasing over the years making nursing education more available. The ministry of Public Health by 1990 had about 19 schools training nursing personnel (all diploma schools). According to the NOHRHC [38] the number of nursing schools stood at 23 for three-year state diploma and post-registration diplomas and 25 for nursing assistants respectively. The ministry of Higher Education got into nursing education in the late 1990s and today counts a total of 4 out of eight state universities with nursing programmes (degree programmes only) and at least 12 private higher institutions offering three-year diploma programmes. Some of these private institutions also offer degree programmes. In recent years nurses with the higher national diplomas (HNDs) now have an opportunity to do a one-year top up programme to get a Bachelor of Nursing Science degree. The most recent recommendations from the World Health Organization (WHO) and its partners assert that countries must modernize regulatory rules by harmonizing education requirements and standardizing nurses' credentials globally [43]. Findings also demonstrates that the quality of nursing education affects health outcomes. Over the past decade international development aid to optimize health crises outcomes has been directed to nursing education. For example, in 2008 the US Congress made a commitment to enhance nursing education in Africa to achieve UNAIDS 90–90 goals that 90% of HIV positive people know their status [44]. As a result, schools of nursing in the Democratic Republic of the Congo, Ethiopia, Lesotho, Malawi, South Africa, Cameroon and Zambia were supported with infrastructure improvement, program revisions, clinical skill development, in- service training, and faculty development. However, the ground-breaking international study by the Lancet Commission on health professional education for the 21st century, called for program that are locally relevant with respect to courses and course content sequencing as well as reflective of international best practices [45] Achieving successful implementation of high-quality standards nationally including sequencing, therefore, is dependent upon

ensuring that the standards not only represent best practices but are adaptable to local contexts and cultures. Irrespective of the various strategies put in place for the training of competent nurse, students in several studies has demonstrated, among other problems, limitations in course content sequencing. The students described the training methods as traditional and teacher-centred, inevitably resulting in minimal student participation. Although the goal of nursing education is to train skilled and experienced nurses who are capable of caring for patients in clinical settings [46], the training approaches without appropriate sequencing, do not adequately equip students with decision-making skills. Consequently, these call for nursing education to focus more on training approaches such as course content sequencing that encourage the development of the critical thinking potentials of pre-service nurses [47]. The nature of the nursing profession requires nurses to poses mastery of the subjects and to be able to apply the theories in practical situations. This can partly be achieved through course content sequencing. Some studies indicated that active education training significantly promoted deep-thinking skills, as well as perpetuating the learned subjects in students' minds [48]. Student's views in current studies reveal that they are unsatisfied with the clinical education environment and equipment, and they assessed the equipment and facilities as mediocre [49].

Learning in the clinical teaching environment is considered to be a fundamental aspect of the nursing education training program where the theoretical courses are sequenced to match with the practical courses, enabling nursing students to integrate their theoretical education into clinical practice, and bridging the gap between theory and action in the nursing profession. Recent studies corroborate the findings of previous reports [50]. [51] found that most students were not satisfied with the methods of evaluation, and students believed that clinical evaluations were not objective as there were no course sequence showing inefficient ordering of events in the training program suggesting the need to revise the processes and tools which are used for such evaluations. Most students believed that there was a lack of coordination between the educational and ward expectations. Some studies have indicated that setting realistic goals that fit the current facilities and conditions help to improve the quality of clinical education [52]. [53] in a study investigating the experiences of nursing students' instructors, and hospital administrators of nursing internship found that asking nursing students to perform activities requiring complex skills was unreasonable, and a close relationship between educational expectations and the expertise needed in clinical and practical situations was essential. Students also viewed educational planning inadequate as there were limited course content sequencing. This view was corroborated by [54] who found that 96 % of students believed that there was no clear and distinct job description in the wards. The existence of a gap between theory and practice in nursing education and training due to inappropriate course content sequencing is a long-standing problem and the lag and discrepancy between the theoretical and clinical aspects of nursing education have caused much concern among instructors, professors, nurses and nursing students [55]. Most students in current studies pointed to the existence of a gap between theory and practice as caused partially by poor sequencing, a problem corroborated by other studies of this issue [50] found that most students believed that they lacked the necessary skills for caring for patients in accordance with the nursing process, and half of them said that, they did not care for the patients based on the nursing process [56]. This suggests that the nursing program should be revised by introducing course content sequencing such that theoretical courses are followed immediately by practical courses in order to fill the gap between the theoretical and practical aspects, and that the time lapse between the learned topics and apprenticeship should be well sequenced and shortened, giving students enough time to integrate the theoretical topics into their practical skills. Students' views generally inferred that a high proportion of their time was allocated to memorizing large amounts of information that did not match the clinical requirements. Students also believed that active participation in the learning process was important, and claimed that they should learn the basic nursing knowledge to be able to solve the problems encountered in clinical situations. Also, nurse educators have expressed their views and opinion in the training of competent nurses. Nurse educators' views are to train nurses whose competencies are compatible with the practice setting demands, in addition to other facilities such as participants management and practice leadership, health advocacy and illness prevention [57], guarantee the continuous production of high quality, secure and efficient patient services. To achieve this, appropriate course content sequencing is needed to prepare nurses with the necessary competencies. Nurse educators have to evaluate demands for the prospective= workforce, based on requirements of the work setting [58]. Nurse educators view it necessary to align education with the practice environment as the healthcare system is becoming complex, training bachelor degree nurses who will be able to meet various patients' needs; function as leaders; and advance science that benefits patients and the capacity of health professionals to deliver safe, quality patient care [59].

1.2 The problem statement

Nurses form the majority of the health work force in Cameroon and the universal access point for almost 90 percent of training users. Efficient preparation of qualified competent pre-service nurses to cope with the current training challenges remains a critical role of nursing education [60]. It has been observed while serving as nurse professional for 21 years that graduates face challenges and take close to 6 months to competently carry out complex nursing procedures. Also, serving as a clinical nurse educator in Regional Hospital Annex Buea, Regional Hospital Bertoua, the researcher Mou Bridget encountered students and graduate's inability to confidently and competently carry out nursing procedures for over 8 months. Functioning as Dean of studies and as nurse educators in several nursing institutions, the researcher also had limitations in implementing the various training program due to inappropriate sequencing of courses. This suggests that training does not adequately prepare students for clinical roles. This can cause a theory practice gap. An assessments of nursing education programmes conducted by WHO and other partners, between 2008 – 2013 revealed that great variations exist with regard to training program orientation. This includes limited balance between theory and practice, absence of appropriate courses sequencing to link theory with practice. All these are negatively affecting the quality of nursing education and practice in the African countries including Cameroon. [61]. Other studies have shown that nursing students' expressed problems and limitations concerning the course sequencing. Although the goal of nursing education is to train skilled and experienced nurses who are capable of caring for patients in clinical settings [62], the present

training program does not have appropriate sequencing of courses to adequately equip the students with professional competencies. Nursing education thus needs to focus more on training strategies such as appropriate sequencing like simulation sequencing that encourage problem solving and critical thinking potentials [62]. The existence of a gap between theory and practice in nursing education and training, and the lag and discrepancy between the theoretical and clinical aspects of nursing education have caused much concern among educators, professors, nurses and nursing students [65]. Thus, the nursing education training program needs to be revised to fill the gap between the theoretical and practical aspect. There is therefore evidence that the present training program in most training institutions, has inadequate sequencing of the course. Little research has been carried out on the views of the various stake holders. Empirical evidence is required to develop guideline strategiesz to inform the educators of competent pre-service nurse.

This study is an attempt to provide answer to the following five research question

1.3 Research questions

1. What are the views of student's nurses (stakeholders1) in their training using appropriate sequencing in training institutions in the North West Region of Cameroon?
2. What are the views of nurse educators (stakeholders 2) in the training of pre-service competent nurses using appropriate sequencing in training institutions in the North West Region of Cameroon?
3. What are the views of other stakeholders (stakeholders 3 such as policy makers, managers of nursing institutions, head of departments of nursing institutions, head of nursing associations, regional delegate of public health) in the training of pre-service competent nurse using appropriate sequencing as innovations in the training program in training institutions in the North West Region of Cameroon?
4. What measures can be adopted to improve the training of pre-service competent nurse using appropriate sequencing in the North West Region of Cameroon?
5. What model strategy can be developed to meet the training of preservice competent nurse using appropriate sequencing in training institutions of the North West Region of Cameroon?

1.4 Objectives of the Study

The general objective of the study is to analyse the views of students, nurse educators and other stakeholders for training pre-service competent nurse using appropriate sequencing in the North West Region of Cameroon.

1.5 Specific Objectives

1. To investigate the views of nursing students (stakeholders 1) in their training using appropriate sequencing in training institutions in the north west region of Cameroon.
2. To analyse the views of teaching nurse educators (stakeholders 2) in the training of pre-service competent nurse using appropriate sequencing in training institutions in the north west region of Cameroon.
3. To investigate the views of other stakeholders (stakeholders 3) in the training of pre-service competent nurse using appropriate sequencing in training institutions in the North West region of Cameroon.
4. To propose uptake measures using appropriate sequencing in the training of pre-service competent nurses in training institutions in the North West region of Cameroon.
5. To develop and recommend model strategies for appropriate sequencing of courses for the training of pre-service competent nurses in training institutions in the north west region of Cameroon.

1.6 Rationale of the study

Findings from students' views in their training will be used to improve their training in training institution in the NWR of Cameroon. Also, findings from nurse educators and other stakeholders' views will be used to improve the training of pre-service competent nurse in the NWR of Cameroon. The measures adopted from the study, will aid in the training of pre-service competent nurses. The training of nurses has been based on the traditional methods and program. WHO [61] suggests that in preparing the work force, the program is expected to meet standards that are often defined as core competencies.'' The programme should respond to the health needs and client expectations. There have been disparities and challenges in the implementation of the competency-based approach leading to a theory practice gap thus this study is intended to develop a strategy to fill up the gap and improve pre-service training of competent nurses.

1.7. Significance of the Study

This study is expected to improve nursing students training through appropriate course sequencing. Findings from the studies is going to improve course sequencing and enhance nurse educators training ability for the preparation of pre-service nurses using appropriate sequencing in training institutions in the NWR of Cameroon. Findings will enhance the designing of the nursing programs by policymakers, ministry of health and higher education. Such a model if grounded in the data will likely be acceptable to all stakeholders and eliminate inconsistencies that might hinder the growth and advancement of the nursing profession in Cameroon. This study will be of help to nursing educations because, the existence of gaps surrounding the sequencing of courses and course content, are identified and improved for the preparation of pre-service nurses. The findings of the study will hopefully

improve the quality of nurses and nursing care and the profession through quality training using appropriate course sequencing. The results will be published in journals, presented to stakeholders in seminars, workshops and conferences**.** Acts as a working tool to improve and respond to the challenges in healthcare delivery especially with COVID19 pandemic and other critical conditions, through` quality pre-service training.

1.8. Delimitations of the Study

The geographical area of this study covered the government training school for State Registered Nurses, St Jude Higher Institute of Nursing, National Polyethnic Higher Institute of learning in Bambui, St Louis Higher Institute of nursing and biomedical, Florence Nightingale nursing training institution both private in the North West Region of Cameroon. The population consisted of; students nurses, nurse educators, other stakeholders (managers of nurse training institution, policy makers, deans and head of departments of nursing training institutions, head of nursing associations) in the North West region of Cameroon. The study was limited to males and females' students of all ages in their final years that is in third year for state registered nurses, higher national diploma and bachelor of nursing science. The study was focused on those nurse educators concerned with the training of nurses. The study involved qualitative research where data was collected through interview and analysed by NVIVO 9 to obtain participants views in training nurses using appropriate sequencing. Also, the study was limited to quantitative research where numeric data on views of participants on training was collected through questionnaires and analysed by SPSS version.

1.9 Operational definition of terms

Strategy

A Strategy is an action that managers take to attain one or more of the organization's goals. In this context a strategy is an action that nurse educators take to attain institutional goals. Strategy here is the overall plan nurse educator's use for deploying course sequencing to establish a favourable position; using a scheme for a specific action.

Sequencing of courses

This is the efficient ordering of courses moving from simple to complex and in this participant, it is the appropriate sequence of the courses such that any theoretical course is immediately followed by a practical course, then practical demonstration in the skill laboratory. This is the followed by clinical internship

Pre-service: Refers to activities or training that a student nurse receive or which take place before a nurse takes up a job which requires specific training, i.e. before a nurse enters service. That is. courses for graduates, and undergraduates, are 'pre-service courses' if they provide the competence needed to perform new 'services.

Pre-service education or pre-service training: refer to any structured activity aiming at developing or reinforcing knowledge and skills of nurses before a nursing professional enters public health service or private practice.

competent nurse: This is a graduate nurse with either a state diploma certificate in nursing, higher national diploma or bachelor of science degree in nursing, entering into practice, who possess the ability to practice nursing that meets the needs of clients cared for using logical thinking and accurate nursing skills. The competent nurse has core abilities such as; the ability to understand needs, to provide care, to collaborate with others.

Pre-service competent nurse: This is a graduate nurse about to start service who is able to demonstrate the necessary ability, knowledge, skills and altitudes across the domains of competencies at a standard that is determined to be appropriate for the level at which a nurse is being assessed.

A nurse: A nurse is a practitioner who has been professionally prepared to care for people with illnesses, diseases, and injuries. Usually, nurses accompany doctors and different training employees in medical organizations and hospitals, and their main role is to help people to feel better, stay fit, and healthy.

Appropriate sequencing: In this context, appropriate sequencing as determined by WHO and other expert partners in 2016, it is the sequence of courses such that theory is immediately followed by practical and the time scale between theory and practice is adequate for each course and the ratio is 1:2. There is adequate sequence of courses such that all pre-requisite courses come first before general courses. The course content is sequenced such that the course outcome meets the students nurse needs.

Students: These are nursing students who are the first stakeholders in their final year of studies for those enrolled for Higher National Diploma (HND) and state register nurse (SRN), the third year and fourth year bachelor degree students. These are students who have gone through the school programme for the three years and can provide rich information about the course content of the training program document of their institutions.

Nurse educators

Nurse educators, second stakeholders are nurses who have obtained advanced nursing degrees that allow them to teach nursing courses in colleges and universities, teaching and helping to train the future nurses. These are nurse educators who have been teaching in nursing training institutions for at least three years and have taught all the levels of nursing students and who can provide rich information about the course contents of the programme in their institutions. These **nurse educators** teach and prepare licensed practical nurses (LPN) and registered nurses for entry into practice positions.

Other stakeholders: In this study other stakeholders are policy makers, Managers and Directors of nursing institutions, Head of departments and Deans of nursing institutions, leaders of nursing associations, regional delegate of public health NWR Bamenda in Cameroon. These are individuals who provided rich information about the course contents of the nursing programmes, who are affected by or can influence a guideline's development and implementation including. These are individual with a legitimate interest in the guideline or anyone affected by the study recommendations.

Model strategy: A model is a representation of the strategy**,** the way the strategy looks visibly. Modelling the strategy makes the thinking clearer to others because they can see the thinking and the relationships that went into the process. The model will be the tool used to actually do the computation. This is a tool for planning course sequence in the nursing programme for training pre-service competent nurse to achieve objectives. It contains strategic measures for the sequencing of courses.

Views: These are the opinion, ideas, perceptions and ways of thinking by students, nurse educators and other stakeholders about nurse training in training institutions

Analyse: In this context is to examine the views of research participants methodically and in detail, in order to explain and interpret their concerns training pre-service nurses.

Uptake measure: Uptake measures in research involves the following; dissemination of research findings, capacity development, influence, collaboration between researchers and users (Communication), incentives and reinforcement. Research uptake is the use of research evidence by researchers, policymakers, implementers or practitioners to inform policy or practice. Research uptake can be both internal and external. Depending on the results of the research study, uptake may result in a change to policy and practice but can equally lead to maintaining the status quo.

Competency based: In this context, it is the sequencing of the training program, with emphasize on the complex outcome of learning process (i.e. knowledge, skills and attitudes to be applied by learners) rather than mainly focusing on what learners are expected to learn about in terms of traditionally-defined subject content. It implies the training program is sequenced in such a way to enable learners gain competence at the end of their training.

2. METHODOLOGY

2.1 Study design

A cross sectional descriptive study design was used. A descriptive design was employed because it was a non-experimental type of research and the variables were measured using numerical terms and was not manipulated by the researchers. Both quantitative and qualitative research methods were used. Qualitative research method [62] was used to gain deep contextual understandings of the subjective social reality of individuals answered questions about experience and meaning from the participant's perspective. It was also, used to allowed the researchers to gain an in-depth understanding, which was difficult to attain using quantitative methods. An in-depth understanding was attained since qualitative research method allowed participants to freely disclose their experiences, thoughts, and feelings without constraint [63].

2.2. Study setting

The study was carried out in the North West Region of Cameroon in training schools that train nurses. The first universities that train nurses are, Catholic University of Cameroon, university of Bamenda, Bamenda University of Science and Technology, International University Bamenda. Other nursing schools are, national polytechnic institute, Florence nightingale higher institute, Bamenda University of science and technology, St Jude Higher Institute, St Louis Nursing School, state registered nursing school. The study participants came from six sampled nursing institutions. These were St Louis Higher institute of learning. It started a nursing school in 2002 with and today, St Louis Higher Institute of Health and Biomedical Sciences has a population of about 880 students. Students are admitted with 'A' Levels or first degrees in other fields. They study for three years and graduate with a Higher National Diploma. Also, a four- year training program for bachelor of science in nursing. Their mission is to support and promote the health of individuals and communities through innovative medical education programs, research initiatives, and clinical excellence in service to society and to improve the health and wellness of all. Their vision is the envision attracting, training, and sustaining diverse individuals who will work together to lead locally, nationally and internationally renowned transformative and socially responsible medical education, research, clinical care, and advocacy. The will to inspire and cultivate physician scholars and leaders who positively impact the health of people and society. Their goal is to produce physicians who are prepared to serve the fundamental purposes of medicine. To this end, physicians must possess the attributes that are necessary to

meet their individual and collective responsibilities to society. The second institution was St. Jude's Higher Institute of Nursing and Biomedical Studies created on the 27th September 2007 with authorization no. 07/0144/MINESUP du 27th September 2007 Prime Minister office Visa 002997 of 2nd September 2007 / 003002 of 20th September 2007 Yaounde / 10494. Its mission is to develop human resources, extend knowledge and its applications beyond the boundaries of their campuses; serve and stimulate the society by developing heightened intellectual, cultural and human sensitivities, scientific, professional and technological expertise, and their graduates cultivating a sense of purpose. The vision of St Jude institute of Nursing is to prepare excellent training providers and leaders to transform the lives of persons and communities through innovative education and training. Their goal is to ensure a flexible learner-centered environment that utilizes information technology to its highest potential to ensure collaboration and inclusiveness, foster the advancement of students through graduate education, ensure a comprehensive, cohesive program which prepares students for leadership in a changing and diverse socio-political world.

The third institution was National Polytechnic Bamenda, located at Mile 7, Nkwen, Bamenda of the North West Region of Cameroon. This higher institute of learning started in 1996 gained full authorization from Cameroons Ministry of Higher Education on August 13, 2002 with Authorization No 002/0074/MINESUP, of 13 August 2002. It was founded by Mr, YONG Francis of blessed memory. This name was in 2010 changed to National Polytechnic Bamenda and in 2016 it was transformed into a full-fledge University Institute by the Cameroon Ministry of Higher Education. Ministerial Order Nº: 16/00359/L/MINESUP/SG/DDES/ESUP/SDA/MM OF January 15, 2016, changing the name from National Polytechnic Bamenda to National Polytechnic University Institute (NPUI). The vision of this institution is to provide learners with the training and skills necessary for jobs and wealth creation. It has over six thousand (6,000) students, 200 nursing students and 12 nurse educators. Graduates exits with higher national diplomas and bachelor degrees in nursing.

Fourth institution was Catholic university of Cameroon non-profit university. It is located in Bamenda Cameroon and obtained authorization on the 6th of July 2009 under N.09/02561/L/MINESUP/DDES/ESUP/SAC/NJE/ebm. The higher education institution was founded in 2010. Has as mission to train highly qualified nurses capable of providing holistic high-quality nursing care in diverse clinical situations locally, nationally and internationally. Objective is to train nurses who are equipped with requisite knowledge, modern scientific reasoning and competent in appropriate application as relates to the discipline in their daily performance of given tasks as a member of a health team. Cameroon catholic university (CATUC) trains higher national diploma and Bachelor of Science in nursing. CATUC has 16 academic staffs and 6 administrative staffs, with a student population of 234 in the department of nursing. Florence Nightingale Higher Institute the fifth trains state registered nurses, higher national diploma and Bachelor of Science in nursing. Programs offered by this institution include: SRN, Higher National Diploma HND Nursing, HND Medical Laboratory Sciences, HND Midwifery, HND Nutrition and Dietetics, HND Sanitary Technology and HND in Training Management. The institution also offers Bachelor Degrees in nursing. The mission of the Florence Nightingale Institute is to develop the history of nursing as an academic discipline and to use it both to add depth to the profession's remit and to strengthen professional pride. The sixth is state register nursing school that trains state registered nurses. Their goal of is to prepare professional nurses who are visionary, possesses leadership skills and has the necessary competencies to meet the demands of the evolving health care system.

The North West Region is one of the ten regions in Cameroon. Its regional capital is Bamenda a metropolitan city.

2.3. Study population by objectives.

Samples were drawn from different accessible population based on the objectives of the study as follows

2.3.1. The student population

There were 381 nursing students. These involved nursing students in the final year for those doing a three years program like Higher National Diploma and State Registered Nurse, including the third- and fourth-years students for bachelor of sciences nursing programs, from the six sampled nursing institutions which were, catholic university of Cameroon**,** Other nursing schools are, national polytechnic institute, Florence nightingale higher institute, Bamenda University of science and technology, St Jude Higher Institute, St Louis Nursing School, state registered nursing school.

2.3. 2. Nurse educator population

A total of 24 nurse educators took part in the study. These were teaching nurse educators, deans of studies, head of departments who have taught for at least three years and most have taught the final year students, in the six sampled training nursing institutions which are, Catholic University of Cameroon, university of Bamenda, Bamenda university of science and technology, International university of science. Other nursing schools are, national polytechnic institute, Florence nightingale higher institute, Bamenda University of science and technology, St Jude Higher Institute, St Louis Nursing School, state registered nursing **school.**

2.3.3. Others stakeholder population

A population of 27 other stakeholders that consisted of, Deans and Head of departments of nursing programs, directors of nursing schools, policy makers, representatives of the Ministry of Public health in the Regional Delegation of public health, heads of nursing associations were drawn from the accessible population.

2.3.4. Uptake measures*:* All data collected from the participants in the five institutions sampled for the study were involved for data analysis to bring out uptake measures for training pre-service competent nurses.

2.3.5. A competency-based sequenced model strategy*:* Information from all participants in the study was used to develop a competency- based sequenced model strategy for recommendation for the training of pre-service nurse in the North West region of Cameroon.

Table 1. Distribution of study population by objectives

Objectives	Institution /origin of study population	Population.
1) Nursing students (year 3 year4 and final year).	Catholic University of Cameroon 234 students	60 students
	National Polytechnic Institute with 500	75 students
	Florence nightingale institute, Bamenda 600	80 students
	state registered nursing school. 180 students	55 students
	St Jude Higher Institute, 150 students	30students
	St Louis Nursing School with 880 students	81 students
		Total 381 students
2 Teaching nurse educators	Catholic University of Cameroon 16 nurse educators	4 nurse educators
	National Polytechnic Institute with 12 nurse educators	4 nurse educators
	Florence nightingale institute, Bamenda 13 nurse	4 nurse educators
	state registered nursing school. 10 nurse educators	4nurse educators
	St Jude Higher Institute, 8 nurse educators	3 nurse educators
	St Louis Nursing School with 14 nurse educators	4nurse educators
		Total 24 nurse educators
Objectives	Institution	Population
3	From managers, directors, head of departments of nursing institutions, heads of nursing associations like Cameroon nursing association, policy makers in in regional delegation of public Health in NWR of Cameroon.	27 stakeholders (other stakeholders)
4	Uptake measures from triangulation and information in nursing institution in the North West Region of Cameroon	Data collected from the 6 participated nursing institutions

2.4. Inclusion and exclusion criteria for study participants.

Inclusion criteria for all participants

For final year students for those doing 3 years for the higher national diplomas and state registered nursing students, were included because they have gone through the training programme for the three consecutive years and could provide information needed about sequencing of course. For the 3rd and 4th year students doing a Bachelor of Science in nursing, they were included because they had gone through the school program up to the fourth year, could provide rich information concerning the course content, and course sequencing and the practical sessions. For the teaching nurse educators, only those who had trained nurses in training institutions for at least three years and who had taught year 3 and 4 students were included. This is because, they could provide needed information about sequencing of courses in the training programs used in training institutions in the NWR of Cameroon. Other participants such as heads of nursing associations were included because they are knowledgeable about nursing education program. Also, because they could provide need information about sequencing of course and course contents of the training programs used in training nursing schools. For policy makers, they were included as they can influence decision about sequencing of courses in the training programmes.

Exclusion Criteria for all study participants

Nursing students not in year doing state registered nurse or Higher National Diploma or 4th year bachelor in nursing institution because they had not gone through the program for all the years and therefore, will not be able to adequately provide good information about sequencing of courses, were excluded. Nurse educators who had not taught for three years and had not taught year 3 or 4 were excluded because they could not provide the needed information.

2.5. Sample size calculation

Since all the population could not be studied, to avoid bias a sample size was selected that represented the study population. Precision-based sample size calculations approach was used. The population size from all the institution was 7135 hence Krejcie & Morgan Formula was used to calculate the sample size based on the study objectives.

Sample size for nursing students (stakeholders 1)
it was obtained, using this method.
N=t2*P(1-P) r N= expected proportion of subject with condition
M2 m= error Margin (0.05)
T=z a=1.96
*N= (1.96)2(1-0.4) (0.4) =3.8416*0.24*
(0.05)2 0.0025 = 368

Thus, the size of sample in this case was 368 participants.

To minimize the non-response errors, non- response rate was taken at ten percent of the sample size.
100*100
7135 =1.33 which is13%

Therefore, sample size was 368+13=381 student participants
The sample size for nurse educators (stakeholders 2).

The sample size was calculated from this method as follows.

N=t2*P(1-P) r N= expected proportion of subject with condition
M2 m= error Margin (0.05)
T=z a=1.96
*N= (1.96)2(1-0.01) (0.01) =3.8416*0.16*
(0.05)2 0.0025 = 15

Thus, the size of sample in this case is 15 participants.

To minimize the non-response errors, non- response rate is taken at ten percent of the sample size.
100*100
7135 =1.33 which is13%
Therefore, sample size was 15+13=28 nurse educators to participate.
Sample size for other stakeholders.

The sample size was calculated fromthis method as follows.

N=t2*P(1-P) r N= expected proportion of subject with condition
M2 m= error Margin (0.05)
T=z a=1.96

*N= (1.96)2(1-0.01) (0.01) =3.8416*0.16*
(0.05)2 0.0025 = 15

Thus, the size of sample was 15 participants.
To minimize the non-response errors, non- response rate was taken at ten percent of the sample size.

10*100
7135 =1.33 which is13%

Therefore, sample size was 15+13=28 stakeholders to participate.

2.6. Sampling technique by objectives

A multistage random sampling technique was used to select the institutions (as listed above), for data collection as follows:

The names of all the institutions in the North West region were written on pieces of papers and the Hat and Draw method used to randomly select five institutions for data collection. Papers were folded each bearing the name of a single institution, and thrown in a hat. An anonymous person drew a paper randomly after shaking from the hat until six institutions were drawn. The sample in each institution was according to the objectives that is, a sample from students, a sample from nurse educators and stakeholders. The sample consisted of nursing students in the six sampled nursing institutions that were made to answer a questionnaire and interview guide designed by the researchers. The sample consisted of nursing students, nurse educators, stakeholders, deans, head of departments and key informants.

Systematic sampling was used to sample students in each institution. A sampling interval of three students was used to select the individuals that comprised the sample of students in each nursing institution. Consecutive sampling was used to select nurse educators in each training institution. Any nurse educator who meets the inclusion criteria was selected until the required sample size was achieved.

2.7. Working Tools

The following materials were used generally for the study:

Laptop, computer with Microsoft excel spread sheet. This was to enable data to be analysed to form a data base

Register: Data collected was registered in the register to enable retrieval of information in participants of corruption of data or power failure.

Tally sheets to ease summation of data collected.
Writing materials, pens, pencils, ruler, and calculator.
Motorcycle for transportation out of town where taxi could not reach.
Taxi for transportation within town and to other divisions of the region.

2.8. Instruments for data collection according to objectives.

This study used both questionnaires and interview guide to collect data from study participants

Questionnaire (see appendix I)

The parts of the questionnaire: the first part was the cover page which highlighted the personality of the researcher academic level, the institution, the topic of the study and information on maintenance of confidentiality. This was to ensure the privacy of all persons, to build trust and rapport with study participants and to maintain ethical standards and integrity of research process. An exploratory qualitative study was conducted to explore key nursing stakeholders' expectations for training pre-service competent nurse using appropriate sequencing in the North West region of Cameroon. The study was to seek detailed understanding of stakeholders' opinions; thus, a qualitative approach was suitable for seeking stakeholders' views, beliefs and perspectives for pre-service training of competent nurse with respect to appropriate sequencing. This study was conducted in main government and private agencies.

The questionnaire was in four sections:

Section A was on demographic information that comprised of seven items **(**gende**r**, occupation, School attending, Class, year of study**,** Agency (government, private, confessional, Region,). Every responded was required to fill all this information.

Section B reserved for students in training nursing institutions and they were required to answer 14 closed ended questions. Participants were instructed in answering the questionnaires, to mark an (X) under any answer that they chose in the answer column that best describes their views. The possible answers were; Strongly agree (SA), Agree (A), Disagree (DA), Strongly disagree (SD), Undecided (UD) (see appendix I)

Section C was for nurse educators. They were also expected to answer 14 closed ended questions. Responded were required, to mark an (X) under any answer that they chose in the answer column that best describes their views. The possible answers were; Strongly agree (SA), Agree (A), Disagree (DA), Strongly disagree (SD), Undecided (UD) (see appendix I)

Section D was interview guide for study participants reserved for the researcher to use.

Interview guide for participants such as managers, Deans, head of departments, directors of nursing schools, were asked for information that were audio taped in order to have richer information about the programme, directive questions were used. Semi structured interview questions were used to interview participants, face to face for at least 45 minutes and consisted of general and open-ended questions. The interview guide included three main questions to each type of stakeholders on their experience in the sequencing of courses, their challenges using sequencing in the training programme and the solutions or way forward for the implementation of appropriate sequencing.

a) Interview guide (for policy makers, heads of Cameroon nursing associations, representatives of ministry of public health in the regional delegation of public health). Respondents were asked for information that were to be audio taped in order to have richer information about the programme. Interviews were scheduled to take place in their offices during working hours. Directive, semi structured, general and open-ended interview questions were used to interview participants. The interview guide included three main questions on their experience of the innovations in the training programme such as sequencing of courses, their challenges using sequencing in the training programme and the solutions or way forward for the implementation of the innovations. Interviews were face to face for at least 45 minutes.

b) Interview guide for managers (directors of training nursing schools, Deans, head of departments of nursing training institutions). Managers were expected to elaborate on their experiences of designing and executing an instructional nursing programme using the innovative approach such as course content sequencing in the training of pre service competent nurses. What challenges and limitations did they face with regards to implementing an educational programme using course contents sequencing as innovative approach. What strategies did they use to manage the limitations and challenges?

c) Interview guide for nurseeducatorsas stakeholders

Nurse educators were asked to elaborate their views and experiences using the course content of the training program in the training of pre-service nurse in training institution in the North West Region of Cameroon. The challenges they encountered using the training program and the strategies used to overcome these challenges?

d) Interview guide for students as stakeholders

Respondents were asked for information that were to be audio taped in order to have richer information about the programme. Interviews were scheduled to take place in their offices during working hours. Directive, semi structured, general and open-ended interview questions were used to interview participants. The interview guide included three main questions expecting students to describe their views and experience using the course content in their training programmes in the training of pre service competent nurses using appropriate sequencing. The challenges they faced using the course content of the training programme, and strategies adopted to overcome these challenges. Interviews were scheduled following the class schedule so as to come in contact with most of the students as they call round for lectures. Face to face interview lasting 45 minutes each was conducted. The interviewers were instructed to adhere to the guide, to briefly introduce the topic and create a good rapport with the interviewees. Interviews ended by expressing sincere gratitude to those who took time off their busy schedule to answer the questionnaires. A very big thank you was accorded to the participants.

2.9. Scoring of the instrument:

The questionnaire was scored based on the answers from the respondents, according to their demographic features, the standards, strategies and degree of pre-service nursing education by the respondents.

2.10 Data collection method

A mixed method for data collection was used. Quantitative data was collected using questionnaires and qualitative data using interview guide.

Data collection method from students

The various head of departments of nursing education and Directors of nursing schools were informed of data collection in the institution during semester period. The schedule for data collection in the various institutions was maintained during the semester in the month of January 2021, since during vacation it could be impossible to meet students. Data was collected by the researcher and workers employed by the researchers to assist in data collection process so as not to miss option in other institutions. This was because the accepted time for data collection clashed with more than one institution. The workers employed with the help of the directors or head of department for nursing education distributed questionnaires systematically to the respondents. One student was administered the questionnaire after every three students, as the students called round for lectures in the classroom. So, questionnaires were given to respondents without discrimination that is, to any respondents on sit following the schedule on the time table. Three hundred and eighty-one (381) questionnaires were distributed to student nurse participants in the six nursing institutions in the North West region of Cameroon. There was a 100% return rate of the questionnaire.

Data collection method for nurse educators

The researchers collected data from nurse educators in the month of January 2021.
The researcher and the workers employed distributed 24 questionnaires consecutively to the nurse educators that participated in the study.

Data collection method for other stakeholders

Data was Collected by trained interviewers using a semi-structured pretested interview guide. The data was collected in the month of January 2021. Data was collected purposefully from 27 participants who responded to the invitations for individual interview on the attendance days scheduled by the researcher. Invitations were sent to, the Regional Delegate of Public Health; President of Cameroon Nursing Association and leadership team of the associations, and chief nursing officer of the institution with year three and four nursing students. The interviewers were nurse educators and other experienced researchers who had long-standing experience of working across the region. One interviewer conducted the interview, while the other took notes and made observations to supplement the consented audio recordings. The participants were informed about the study, and time and place of the interviews by telephone and email. All interviews were conducted with the participants only at their places of work (offices). The KIIs interviews lasted for an average of 25–45 minutes, and was audio recorded after obtaining the participants' consent.

Results and uptake measures

The whole information from introduction, background, literature review and the results from both quantitative and qualitative data were triangulated to have a comprehensive result, what the current content says and uptake measures were analysed. Data from the five sampled institutions in the North West Region were used for analysis.

2.11. Method of data analysis

For the quantitative data collected from the participants, it was scored and entered into a register, then the data was put into computer software as database. Analysis using SPSS 11,5 version was used. Descriptive statistics was used to describe the

dataset, provide understanding for the details of the data by summarising and providing patterns from the data sample. Frequency analysis to analyse the categorical data was employed. Percentages analysis, frequencies were converted into percentages to make data clearer. Inferential statistics was then used to make predictions and highlight possible outcome from the analysed data obtained from descriptive statistics. Cross tabulation was used to show the relationship between the demographic groups and to simplify understanding. To analyse the qualitative data, responses from all the stakeholders were read to gain understanding and insight into the stakeholder's view regarding challenges training pre-service competent nurses with regards to sequencing of courses. The responses were transcribed word verbatim. Key themes which emerged from the responses were identified and grouped into predetermined categories. The recorded interviews were transcribed verbatim and the data entered into NVIVO version 9 (QSR International, Australia). Thematic content analysis was used for the analysis, the data was coded. Further coding was performed to allow the emergence of new themes based on rereading of the transcripts. From the initial code lists, subcategories were identified, and consolidated into main categories. Reporting of the results was adhered to the consolidated criteria for reporting of qualitative research guidelines.

Ethical consideration

Authorization to conduct this study was obtained from the faculty of Health Science, University of Bamenda. Ethical clearance was also sought from the Faculty of Health Sciences, University of Bamenda and the Regional Delegation of Public Health for the North West Region in Cameroon. Appendix IV, V and VI show respectively, the ethical approval from the University of Bamenda, and the authorisation to collect data from the North West Regional Delegation of Health in Cameroon**.** Authorization was obtained from the institutional Review Board, the Head of Department of nursing institution appendices V11 and V111. Directors of nursing Schools in the North West region were forwarded each a copy, stating that the confidentiality of participants was maintained and harm was not be enacted to any participant. Participants were comprehensively informed about the aims and procedures of the study before a written informed consent was obtained from each of the participants. The confidentiality and anonymity of participants were ensured by assigning a code to each participant; known only to the participant and researchers. The study process did not involve manipulations or any harmful effects on participants.

Informed Consent

This has to do with the researcher obtaining the participants agreement to participate in the research. Informed consent means that participants have adequate information regarding the research, are capable of comprehending the information, and have the power of free choice, enabling them to consent to or decline participation voluntarily. This consent according to [64] should be sought within a moral framework to ensure autonomy, confidentiality and anonymity; telling the truth and guaranteeing non-coercion and non-exploitation of the individuals concerned. [65] emphasizes the phrase 'voluntary informed consent' implying the participant was able to choose freely to give consent and subsequently participate in the research. The researcher has to equally ensure that the participant is competent and mentally fit enough to give consent after receiving information. To obtain informed consent in this study, the researchers provided the potential participants with the full address of the supervisory institution and the researcher's own address as well. They were equally told why and how they were selected for the study. The purpose of the research, the type of data and data collection method including the approximate amount of participant's time to be taken during the interviews, was communicated to the participants. They were informed that there were no potential risks and no benefits involved in taking part and how their rights were to be respected. Considering that this study was qualitative with a constructivist theory methodology, it was difficult to predict the flow of questions, the duration and frequency of interviews because these will all be determined by the emerging data. To address issues, there should be an informed consent statement at the beginning with as much information as possible as well as adoption of the process consent. However, participants were informed that there was a potential for subsequent interviews as the analysis was going on. They were asked to give permission to be interviewed a number of times as necessary and at their convenience. The informed consent document used in this study is shown on Appendix II. However, all study participants expressed satisfaction with the study and complemented its potential to positively impact in the training of pre-service nurse in Cameroon

In this chapter the argument for the study design was made. The researcher argued that constructivist theory methodology was the most appropriate method to analyse pre- service training of competent nurse in the North West Region of Cameroon. In line with other researchers' views, the researcher demonstrated the rational for selecting constructivist theory. The researcher argued that the reality of the nurse training experience in Cameroon and its future direction could be created by the interaction between nursing and its environment thus presenting potentials for unique context-specific differences from international trends. The discussion on the application of the method in the study was also made with the goal of providing rich descriptions to demonstrate trustworthiness of the study process. Ethical considerations applied before, during and after the study process were also described. The next chapter provides a constructivist grounded theory interpretation of the study results. It shows how the subcategories and categories were created from the emerging data and establishes the link between the emerging categories.

3. RESULTS

Three main theories, constructivist theory, social learning theory and situated learning theory are applied in the presentation of the research results in this chapter. The quantitative data was collected from student nurses in the third level and final year, teaching nurse educators who have taught for three years and has taught the final year students and level three student nurses. The quantitative data was analysed using SPSS version 11.05. The qualitative data was from in-depth interviews of study participants

(stakeholders who were student nurses, teaching nurse educators, policy makers, managers and head of departments of nursing institution, heads of nursing associations, and the Regional delegation of public health). The qualitative data was analysed using NVIVO version 9. Appendix II

These results are presented in four sections. The first and second sections deal with quantitative results from students' stakeholders 1 and nurse educators' stakeholders 2. The third section is based on qualitative results from all stakeholders that lead to the emergence of categories and sub-categories and the fourth section presents pertinent results from triangulation of data and uptake measures that end with a model strategy for training pre-service nurse. This chapter ends with a summary of the findings that leads to the next chapter.

A: Objective 1, Students (stakeholders 1) Students views about the use of appropriate sequencing in Nursing institutions in the NWR of Cameroon.

3.1. Views of students in their training using appropriate sequencing in training institutions in the North-West region of Cameroon

Quantitative results

The majority of the respondents were females (83%) and were from National Polytechnic University Institute (NPUI) Bamenda with (28.7%). In terms of year of studies, majority were year 3 students (79%). 21% of the students were in the 4th Year.
According to the result, majority of the students (76.3%) came from privately owned institutions,while only 15% were from government ownedinstitution.

Table 2. Distribution of views of students about appropriate sequencing in the training of pre-service competent nurse in the NWR of Cameroon

Variable	S A	A	D	S D	undecided
The school course sequence meets the need of the student Nurses	112 (29.5)	204 (53.7%)	35 (9.2%)	25 (6.6%)	(0.8%)
The course content is structured orderly such that all theoretical courses come before practical courses	161 (42.4)	161 (42.4)	46 (12.1)	6 (1.6%)	6 (1.6%)
There are some courses in the course content that were supposed to be taught before other courses	103 (27.1)	155 (40.8)	58 (15.3%)	30 (7.9%)	28 (7.4%)
There are some courses which you felt ought to be in the course content but are absent	72 (18.9%)	83 (21.8%)	163 (42.9%)	31 (8.2%)	28 (7.5%)
Each course content is well sequenced such that new content studied build up on previously learnt material	110 (28.9%)	204 (53.7%)	40 (10.5%)	14 (3.7%)	10 (2.6%)
Clinical experiences are arranged from easy to difficult tasks	160 (42.1)	116 (30.5%)	44 (11.6%)	21 (5.5%)	16 (4.2%)
Time allocated for theoretical courses is short such that students can practice in clinical sites immediately after they finish each Course	61 (16.1%)	108 (28.4%)	126 (33.2%)	75 (19.7%)	9 (2.4%)
The program is structured such that it contains clinical courses and clinical competencies that enable planned experiences to be implemented and match theoretical courses	114 (30%)	196 (51.6%)	44 (11.6%)	11 (2.9%)	14 (3.7%)
There is a perfect match between theoretical courses and clinical courses in the pre-service training of competent nurses	145 (38.2%)	166 (43.7%)	39 (10.3)	21 (5.5%)	8 (2.1%)

Table 3. Stratification of the Responses of Students Based on Gender (Sex)

Variable	Views	Gender		P Value
		Female	Male	
School course sequence meets the needs of the student nurses.	Strongly Agree	85 (76%)	27 (24%)	0.012
	Agree	175 (86%)	28 (13%)	
	Disagree	32 (91%)	3 (9%)	
	Strongly Agree	20 (80%)	5 (20%)	
Course content is structured orderly such that all theoretical courses come before practical courses.	Strongly Agree	122 (76%)	38 (24%)	0.106
	Agree	141 (88%)	20 (12%)	
	Disagree	42 (91%)	4 (9%)	
	Strongly Agree	4 (67%)	2 (33%)	
Each course content is well sequenced such that new content studied build up on previously learnt material.	Strongly Agree	93 (85%)	17 (15%)	0.229
	Agree	168 (82%)	36 (18%)	
	Disagree	32 (80%)	7 (18%)	
	Strongly Agree	12 (86%)	2 (14%)	
The time allocated for theoretical courses is very short Such that students can practice in clinical sites immediately after they finish each course	Strongly Agree	56 (92%)	5 (8%)	0.445
	Agree	84 (78%)	24 (22%)	
	Disagree	105 (83%)	21 (17%)	
	Strongly Agree	60 (80%)	14 (19%)	
There is a perfect match between theoretical courses and clinical courses in the pre-service training of competent nurses	Strongly Agree	121 (83%)	24 (17%)	0.028
	Agree	136 (82%)	30 (18%)	
	Disagree	30 (77%)	9 (23%)	
	Strongly Agree	17 (81%)	3(14%)	

Table 3. Stratification of the Responses of Students Based on Gender (Sex) (Continued)

Variable	Views	Gender		P Value
		female	Male	
Course content of the institution meets the expectations for the training of competent nurses at the international standards	Strongly Agree	8(67%)	4(33%)	0.155
	Agree	4 (40%)	6 (60%)	
Course content is well structured such that theory comes before practical.	Strongly Agree	8 (50%)	8 (50%)	0.667
	Agree	4 (50%)	4 (50%)	
Sometimes educators decide to teach a particular content before another eve though it has been arranged differently in the content.	Strongly Agree	4 (67%)	2 (33%)	0.446
	Agree	6 (50%)	6 (50%)	
	Strongly Disagree	2 (50%)	2 (50%)	
There is some content which ought to be in the syllabus, but it is absent.	Strongly Agree	4 (40%)	6 (60%)	0.494
	Agree	4 (50%)	4 (50%)	
	Strongly Disagree	2 (100%)	0 (00%)	
	Disagree	2 (50%)	2 (50%)	
Student nurses are well grounded in theory before going for clinical experience.	Strongly Agree	8 (57%)	6 (43)	0.319
	Agree	4 (50%)	4 (50%)	
The time lag between theory and clinical laboratory and practice environment is adequate for each course.	Strongly Agree	2 (33%)	4 (67%)	0.587
	Agree	6 (60%)	4 (40%)	
	Disagree	4 (50%)	4 (50%)	
The course content is structured such that it contains clinical courses and clinical competencies to match theory.	Strongly Agree	4 (40%)	6 (60%)	0.155
	Agree	8 (67%)	4 (33%)	
The institution program is structured to meet standards for the training of pre-service competent nurses.	Strongly Agree	12 (67%)	6 (33%)	0.018
	Agree	0 (0%)	4 (100%)	
	Disagree	0 (0%)	2 (100%)	

According to table 3 above, there were some differences in the views of students between the genders. Majority of the female students (61%) agreed on the program meeting the needs of the training, compared to the male counterpart (26%). The difference was statistically significant (P=0.012). In terms of structure, content of the courses and time allocated for theoretical courses, the differences between males and females were not statistically significant (P= 0.106; P= 0.229; P=0.445). The differences in terms of perfect match between theoretical courses and clinical courses was statistically significant (P=0.028).

Table 4. Distribution of relationship between student views about appropriate sequencing and year of study.

Variable	Year of study		P Value
	Year 3	Year 4	
School course sequence meets the need of the Student Nurses	171 (84%)	33 (16%)	<0.001
Course content is structured orderly such that all theoretical courses come before practical courses	129 (80%)	29 (18%)	0.208
Each course content is well sequenced such that new content studied build up on previously learnt material	162 (79%)	42 (21%)	0.002
Time allocated for theoretical courses is very short Such that students can practice in clinical sites immediately after they finish each course	85 (79%)	20 (19%)	0.424
There is a perfect match between theoretical courses and clinical courses in the pre-service training of competent nurses	133 (80%)	30 (18%)	0.028

Majority of the students who agreed that the course sequence meets the need of the student nurses were the year 3 students. The difference from other years were statistically significant (P<0.001). In terms of structure and time allocated for theoretical courses, the 3rd year students were the majority, though the differences between different years were not statistically significant (P=0.208; P=0.242). For the course content, the 3rd year students had the highest views and the difference was statistically significant (P=0.002). The differences in terms of perfect match between theoretical courses and clinical courses was statistically significant (P=0.028), with majority being the 3rd year students.

Table 5. Distribution of relationship between student views about appropriate sequencing from various institutions

Variable	Institution						P Value
	A	B	C	D	E	F	
School course sequence meets the need of the student nurses.	14 (7%)	62 (30%)	13 (6%)	55 (27%)	25 (12%)	48 (24%)	<0.001
Course content is structured orderly such that all theoretical courses come before practical courses.	8 (5%)	52 (32%)	9 (6%)	45 (28%)	18 (11%)	38 (24%)	0.005
Each course content is well sequenced such that new content studied build up on previously learnt material.	10 (5%)	46 (23%)	12 (7%)	60 (29%)	20 (10%)	68 (33%)	<0.001
Time allocated for theoretical courses is very short Such that students can practice in clinical sites immediately after they finish each course.	10 (9%)	27 (25%)	10 (9%)	33 (30.6%)	12 (11%)	26 (24%)	0.009
There is a perfect match between theoretical courses and clinical courses in the pre-service training of competent nurses.	12 (7%)	38 (22%)	12 (7%)	45 (27%)	2 (14%)	48 (29%)	0.048

The students from different higher institutions were questioned. Table 5 above shows their views for each institution. The students from B, were the majority, followed by students from D, and F**.** The differences in student's views between the institutions were highly significant as all P-Values were less than 0.05 (Table 5). Students' views using appropriate sequencing of courses in the training of pre-service nurse in training institutions in the North West Region of Cameroon.

Qualitative results

For qualitative data collection from students, nursing students were asked to explain their views about appropriate sequencing in using the course content of their school training programme, the challenges or limitations they encountered in using the course content of the training program, and what strategies did they use to overcome these challenges. After analysis of the data with NVIVO 9 version, the following themes were obtained.

Table 6. Students views about appropriate sequencing in using the course contents of their institutions in their training

Themes	Corresponding quotes
Positive views about appropriate sequencing	*''They structure our program in such a way that we finish all our courses for the semester before we go for internship because there are some courses that are linked to practical such as dental care so that we will not be surprised when we get to the field.''[student nurse 15].* *''The training is structured in such a way that the teacher teaches us all the courses before we go for clinical experience'' [participants 16].* *''Since from year one we had theoretical and few pathological classes and after we have acquired some theoretical knowledge, we then go in for clinical experience, that is after the Anatomy and few pathologies. The school then program us to go to the hospital to witness the procedure and improve our dexterity. In year two we enter into more of pathologies and further clinical experience and some specialty courses and in the third year, we started doing theoretical part and some specialty internship.'' [participants 18].* *''The training program to me is good because when they put out the program is in such a way that we have lectures at one point then we go out for internship so that we can match what we have learn with practice.'' [participants 22].* *''The program is structured in such a way that students can easily understand the courses.'' [participants 23]* *''My experience from year one to four was good in using the course content because it was structured in such a way that was easy for me to follow the courses.'' [participants 25].* *''The training program is well structured such that we can follow up our courses but lack demonstration course.'' [student nurse 28].*
Negative views of students	*''The course content does have limited practical demonstration courses''[participants17].* *''I did not see practical demonstration courses in the training program'' [participants 26]* *''My experience has not really been the best for the fact that you have large volume of work to accomplish for a very short period of time and you are expected to memorise all of that before exams or clinical making it difficult to apprehend everything that has been taught for that period.''[participants 19].* *''The course content is very stressful. There are courses that we do that are not on the training program. I don't know weather is because they split them into subtopics but the courses are many.'' [participants 20].* *''The training program is in such a way that they teach for a certain length of time, continuous assessment then they give us another time to sit in class with our lecturer then exams. They don't really carry out practical. That is practical is not frequent.'' [participants 21].* *''The courses are bulky and in such a way that each course is not followed by a practical course'' [participants 23].* *''The training program was very tight and choked up because sometimes I rush so as to cover up, one is bound to omit some important information and there are some courses in the course content though they relate to nursing they are not directly applied. When I go for clinical practice these courses are insignificant because they are not directly applied on the patient at the time.'' [participants 27].* *''The school program is in such a way that the courses match the practical but the duration of theory relative to the duration for internship is not the same'' [participants 27].*

Challenges students encountered about appropriate sequencing in their training in training institutions in NWR of Cameroon

Nursing students during interviews, were asked to elaborate the challenges or limitations they encountered about appropriate sequencing in the training program in their training in training institutions in NWR of Cameroon. Data collected, was analysed by NVIVO 9 and the following themes emerged.

Table 7. Various challenges of student about appropriate sequencing in their training in training institutions in the NWR of Cameroon

Themes	Corresponding quotes
Inadequate sequencing of courses in the program.	*''Some courses were absent and some were not taught before we went for clinical experience.'' [participants 16].* *''What you see in the hospital is not what is taught in school, it seems so abstract when you want to apply it practically in the hospital, so, is like you are doing two different version of the theoretical part of nursing and practical part of nursing.'' [participants19].* *''The courses are too many to study before exams.''* [participants 20]. *''Some lecturers did not finish their courses before internship such that in the clinical field I was embarrassed when I saw some procedures and was asked questions.'' [participants 26]*
Limited practical after each theoretical course	''*Practical courses are limited except for the internship.'' [participants 21]* *''We are not taught practical and when I am taught practically in the field, in the presence of a client I feel embarrassed when they did not teach me practically in school.''[participants17]* *''there are limited demonstration courses on the training program'' [participants28]*
Inadequate time scale between courses.	*''Time was a problem because some courses were taught for longer periods and others for shorter periods'' [participants 15].* *''We had a problem of time spacing that is, the time given for theoretical course is too long compared to the time for clinical experience.'' [participants 18]* *''Some teachers do not maintain the time and what is written in the course sequence making it difficult for me to follow the course content.'' [participants 24]*

Table 8. Challenges of students in their training using appropriate course sequencing in training institutions in the North West Region of Cameroon

Various challenges of Students	% frequency	% c
Inadequate sequencing of courses in the program	50.%	52.97%
Limited practice after each theoretical course	28.57%	41.83%
Inadequate time scale between courses.	7.14%	5.6%

From table 8, it can be seen that 50% of participants faced challenges with the courses with a percentage coverage of 52.97%. Though, challenges with courses in the program has highest percentage coverage, it is closely followed by problems with practice as 28.57% participants with a percentage coverage of 41.83% and that of lectures and timing cannot be minimized.

Strategies used by students to overcome challenges faced about appropriate sequencing in their training in training institutions in the NWR of Cameroon

Nursing students were asked to elaborate on the strategies they adopted to overcome the challenges they faced with appropriate sequencing in the training program in training institutions in the NWR of Cameroon. Data collected from interviews was analysed by NVIVO 9, appendix II and the following themes emerged see table 9 below.

Table 9. Various strategies adopted by students to overcome challenges about appropriate sequencing in their training in training institutions in the NWR of Cameroon

Themes	Corresponding quotes
Positive behaviour of students.	*''I struggled to use internet to Google search information for the uncompleted courses.'' [participants15]* *''The only thing I did was to Google search and make notes on the subject not taught.'' [participants 16].* *''I always look for weekends to do some practical but still with difficulties.'' [participants 17]* *''As a student, after the internship, I always look for time during the weekend to go to the hospital to accomplish the objectives to improve my dexterity'' [participants 18].* *''And in the hospital, I learn from the senior nurse.'' [participants 19].* *''I created more time to study'' [participants 20.]* *''I had to work very hard as days went by'' [participants21].* *''I worked hard and google searched to overcome the challenges of inadequate time scale.'' [participants 23].* *''I make sure that I do all my work, go ahead of the syllabus and google search what I don't understand.'' [participants 24].* *''I tried to understand the teacher and the course, I read ahead and beyond the course content to overcome this.'' [participants 25].*
Improving Practice	*''I propose that practical courses be appropriately sequenced as to match clinical practice with theory.'' [participants 21]* *''I also propose that they should include those practical courses lacking in the course sequence.'' [participants 23].* *''I used my personal effort to practice use my phone when they asked me certain questions in the clinical siting, I Google searched because when some nurses ask a question and I don't know they will not give the answer.'' [participants 26].* *''I find time and practice before internship.'' [participants 28].* *'The courses sequence should have all practical courses and the duration for practical experience in each unit should be increased so that student can accomplished their objectives. I am also proposing that the various training practical sites should have competent nurses to follow the practical clinically.'' [participants 27]*

Table 10. Strategies adopted by students in overcoming challenges about appropriate sequencing in their training in training institutions in the NWR of Cameroon

Various strategies	Percentage frequency	Percentage coverage
Positive behaviour of Students	66.6%	51.26%
Improving practice	33.33%	48.74%

From table 10 in this study it can be seen that about 66.6% of participants adapted certain behaviours to overcome the inconsistencies of courses in the training programme with a percentage coverage of 51.26%.

B: objective 2

Nurse educators (Stakeholders 2)

3.2. Nurse educators' views about appropriate sequencing in the training of pre-service competent nurses in training institutions in the North-West Region of Cameroon

Quantitative Results

There were 24 questionnaires that went out for the interview of nursing educators in higher institution of learning in the North-West Region that train nurses. All the questionnaires that went out were all answered, and the return rate was 100%. According to the result, there was equal number of male and female educators (50%). Based on the distribution according to institution, most of the educators came from Institute B with 41.7%, and from government owned institution (55%). Results show that majority of the educators strongly agreed that the course content meet the training of competent nurses at the international standards (50%). Most of them also agreed that they sometimes decide to teach a particular content before another even though it has been arranged differently in the content (50%). Majority of the educators also agreed strongly that there is some content which ought to be in the

syllabus, but it is absent (41.7%). According to the educators, student nurses are well grounded in theory before clinical experience (58.3%) (see table 11 below)

Table 11. Distribution of views of educators about appropriate sequencing in the training of pre-service competent nurses

Variable	S A	A	S	D
The course content of the institution meets the expectations for training of competent nurses the international standards	12 (50%)	10 (41.7%)	0.0 (0.0%)	2 (8.2%)
Course content is well structured such that theory comes before practical.	16 (66.7%)	8 (33.3%)	0.0 (0.0%)	0.0 (0.0%)
sometimes decide to teach a particular course before another even though it has been arranged differently in the content.	6 (25%)	12 (50%)	4 (16.7%)	2 (8.3%)
There are some courses which ought to be in the syllabus, but there are absent	10 (41.7%)	8 (33.3%)	2 (8.3%)	4 (16.7%)
Student nurses are well grounded in theory before going for clinical experience	14 (58.3%)	8 (33.3%)	0.0 (0.0%)	2 (8.3%)
The time lag between theory and clinical laboratory and practice environment are adequate for each course.	6 (25%)	10 (41.7%)	0.0 (0.0%)	8 (33.3%)
The course content is structured such that it contains clinical courses and clinical competencies to match theory	10 (41.7%)	12 (50%)	0.0 (0.0%)	2 (8.3%)
The institution program is structured to meet the training of pre-service competent nurses	18 (75%)	4 (16.7%)	0.0 (0.0%)	2 (8.3%)

There were some differences in the views of the educators from different institutions, with the highest differences from E and F, but the differences were not statistically significant as P-Values were all greater than 0.05, except for the point of absent of some content in the syllabus (P = 0.049), student nurses being well grounded in theory before going for clinical experience (P = 0.031) and the time lag between theory and clinical laboratory and practice environment being adequate for each course (P = 0.018) (Table 12 below).

Table 12. Distribution of differences in educators' views about appropriate sequencing from various institutions

Response	Institution						P Value
	A	B	C	D	E	F	
Course content of the institution meets the expectations for the training of competent nurses at the international standards							
Strongly Agree	2(17%)	0 (0%)	2(17%)	0 (0%)	4 (33%)	4(33%)	
Agree	0 (0%)	2(20%)	0 (0%)	2(20%)	4 (40%)	2(20%)	0.261
Disagree	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2(100%)	0 (0%)	
Course content is well structured such that theory comes before practical							
Strongly Agree	2(13%)	0	2(13%)	2(13%)	8 (50%)	2(13%)	0.055
Agree	0(0%%)	2(25%)	0 (0%)	0 (0%)	2 (25%)	4(50%)	
Sometimes decide to teach a particular content before another even though it has been arranged differently in the content							
Strongly Agree	0 (0%)	0 (0%)	2(33%)	2(33%)	0 (0%)	2(33%)	0.098
Agree	2 (17%)	2(17%)	0 (0%)	0 (0%)	6 (50%)	2(17%)	
Strongly Disagree	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (50%)	2 (50%)	
There is some content which ought to be in the syllabus, but it is absent							
Strongly Agree	0 (0%)	2(20%)	2(20%)	2(20%)	4 (40%)	0 (0%)	0.049*
Agree	2 (25%)	0 (0%)	0 (0%)	0 (0%)	4 (50%)	2(25%)	
Strongly Disagree	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2(100%)	
Disagree	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (50%)	2 (50%)	
Student nurses are well grounded in theory before going for clinical experience							
Strongly Agree	0 (0%)	0 (0%)	0 (0%)	2(14%)	8 (57%)	4(29%)	0.031*
Agree	2 (25%)	2(25%)	2 (0%)	0 (0%)	0 (0%)	2(25%)	
The time lag between theory and clinical laboratory and practice environment is adequate for each course							
Strongly Agree	2 (33%)	0 (0%)	0 (0%)	2(33%)	2 (33%)	0 (0%)	0.018*
Agree	0 (0%)	0 (0%)	2(20%)	0 (0%)	4 (40%)	4(40%)	
Disagree	0 (0%)	2(25%)	0 (0%)	0 (0%)	4 (50%)	2(25%)	
The course content is structured such that it contains clinical courses and clinical competencies to match theory							
Strongly Agree	2 (20%)	0 (0%)	2(20%)	2(20%)	2 (20%)	2(20%)	0.160
Agree	0 (0%)	2(17%)	0 (0%)	0 (0%)	6 (50%)	4(33%)	
Disagree	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2(100%)	0 (0%)	
The institution course content is structured to meet the training of pre-service competent nurses							
Strongly Agree	2 (11%)	0 (0%)	2(11%)	2(11%)	6 (33%)	6 (33%)	0.100
Agree	0 (0%)	2(50%)	0 (0%)	0 (0%)	2 (50%)	0 (0%)	
Disagree	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2(100%)	0 (0%)	

* *Statistically significant*

Qualitative results for research objective 2

3.2.1. Nurse educators' views about appropriate sequencing in the training of pre-service competent nurse in training institutions in the North West Region of Cameroon

Nurse educators were asked to elaborate on their views and experience about appropriate sequencing and executing innovation in the sequencing of courses in the training of pre-service nurse in training institutions in the NWR of Cameroon. Data collected from interviews was analysed by NVIVO 9 version and the following themes emerged.

Table 13. Nurse educators' views about appropriate sequencing in the training of pre-service competent nurse in training institutions in the North West Region of Cameroon

Themes	Corresponding quotes
Positive views of nurse educators	*''The institution since 2005 when I started teaching was objective based approach, that is , just teaching what you are given to teach, the innovation is recent in the school program, in 2021 which is competency based approach, but with this new approach, the objectives are very clear and the competencies that at each training course the student is supposed to achieved. Another innovation in the course sequence is the entrepreneurial course added to enable students have something doing and not just be job seekers.''* Furthermore, another interviewee stated: *''I had a good experience using the training program. Basically, the new program for nursing is a competency based and also has capacity building, so we know what they can do after training.''*
Negative views of nurse educators About appropriate sequencing	*''When I look at the new course content there are few changes and there are more gaps because there are courses which ought to come before others so that the students have basic foundation before other courses but these courses come after. For example, research in nursing project, is the first course when student have not yet mastered any basic knowledge of the nursing profession.'' [nurse educator 10].* *''In using the different course contents in most of the participants it is not particular as for HND, they give out the courses but there are little innovation though some institutions lay more emphasis on the practical demonstration and actually uphold the clinical demonstration than others but most of the courses are similar.''[participants 7]* Similarly, the other interviewee stated: *''I say first of all in relation to the courses, they are some lapses in the sense that there are some aspects in the courses that are to be taught practically to augment the teaching that has been done. The lapses I don't know because, practical equipment that are to be used are not available one can't meet up with the level that they are supposed to be.'' [participants 9]*

Table 14. Views of nurse educators on the elaboration of appropriate sequencing in the training program for the training of pre-service nurse

Different Views	Frequency	% frequency	Percentage coverage
Negative views of nurse educators about appropriate sequencing	3	42.85%	54.42%
Positive views of nurse educators	4	57.14%	45.58%

From table 14, it shows that majority nurse educators 57.14% participants have positive views on the current course sequence in the various institutions in the North west Region of Cameroon with a percentage coverage of 45.58%

Challenges nurse educator faced about appropriate sequencing in the training of pre-service competent nurse using the training program in training institution in the NWR of Cameroon

Nurse educators were interviewed to elaborate on the limitations or challenges they face in the training of pre-service competent nurse using the course content of the program in various institutions in the NWR of Cameroon**.** Data was analysedbyNVIVO 9, the following themes emerged. See appendix IIb

Table 15. Challenges nurse educator faced about appropriate sequencing in the training of pre-service competent nurse using the training program in training institution in the NWR of Cameroon

Themes	Corresponding quotes
Inadequate course sequence	*''The course content that is available is direct translation from French to English. Sometimes you have to be verse with the French language in order to understand what the course content is all about and at times the French version is not available making it difficult to understand.'' [14]* Another participant also commented: *''When the course content was revised, it was translated from French to English, the language does not really fit.'' [nurse educator 7].* *''In some of the courses and if you are not really a nurse educator, you will give the students less than what is expected, no details of the courses. It is quiet macro and not micro in such a way that you can pick out the details and if a student has not gone through the course will miss out several of the things on the course'' [participants 7].* *''The course content is inadequate because some courses are lacking'' [participants 10].* *''At first, in some part of the program, they will list a topic you have to teach such as a course on pathology they will list that you have to teach this and that, etc. and so one will not know what is embodied in the etc.. In terms of practice the demonstration room is not elaborate enough in terms of equipment and materials needed to inculcate the knowledge needed to articulate for the student.'' [participants 11].*
Inadequate course sequence	*''The main aim was restructuring the course content and the challenge we have had with that is harmonizing because many courses were not appropriately arranged within the training program.'' [participants 6].* *''The course content is too summarised. They can take a subtopic as a main course. The language was too direct form French to English'' [participants 7].*
Inadequate timing	*''There were also some courses that appeared that the time frame to teach that course was not adequate. So, I can either summarise it or go beyond the time frame [participants 11].* *''Time was really a problem because time allocated for some courses was short, that led to non- completion of some courses.''[participants 8].*
Limited practical demonstration courses	*''There are limited practical demonstration courses in the training program in some institutions. [participants12]* *'' Also, there are some practical courses that are not elaborated and I may not understand how to get information and some important issues that one need to add, so much such that when one teaches that course now and some other person wants to teach the course, may not be the same. So, the information will not be coherent because one has an idea on what one is about to teach and some other person has his own.'' [participants 7].*

Table 16. Challenges of nurse educators about appropriate sequencing for training pre-service nurse in the north west region of Cameroon

Various challenges	Percentage Frequency	Percentage coverage
Inadequate timing	28.57%	34.81%
Inadequate course sequencing.	57.14%	44.36%
Limited practical courses	14.28%	20.82%

From table 16, 57.14% participants faced problems with the courses with percentage coverage of 44.36%.

Strategies employed by nurse educators to overcome challenges about appropriate sequencing for the training of pre-service nurse in training institutions in the NWR of Cameroon

Nurse educators were asked the strategies they employed to solve the challenges they encountered about appropriate sequencing in executing the training program for the training of pre-service nurse in training institutions. After data analysis by NVIVO 9, the following themes emerged as shown in table 17 below.

Table 17. Strategies employed by nurse educators to overcome challenges about appropriate sequencing for the training of pre-service nurse in training institutions in the NWR of Cameroon

Themes	Corresponding quotes
Revise course sequence	*''As a nurse educator experienced in the field, I have to sit and rearrange the courses because as it is structured according to semester, there are some courses that are to be taught before others but are sometimes misplaced within the course sequence. So we have to sit and rearrange to come up with an internalized programme such that if the content says I have to teach a course in the second semester and I realise that it is a first semester course I have to bring it to the first semester and take the other course to the second semester. Th111is is done such that at the end of the 3 years all the courses are taught.'' [participants 12]* In addition, *''We also arrange it in such a way that makes understanding easier for the student. Also, if I realise that a topic is to be taught before another in the same semester, I will teach course 2 before course 1 depending on how I see it so that the materials flow comprehensively for the student.'' [nurse educator 12]*
Teaching hours/timescale	*''We could readjust the teaching hours to suit the course so that the student gets the competencies required'' [participants 11]*
Revise course content	*''I prepare my notes to make up the lapses up to international standard.'' [participants 10].* *''I had to merge sub topics to make a course. I had to work hard to bring out the details of each course.'' [participants 11].* *''For each course I will go through the objectives, its course content, if there are issues at my level, I will first develop the content.'' [participants 14].* *''I work out the details for each course. I have practised for 11 years as a nurse so I look at some of the things and the practice so I reflect some of the theory and practice challenges I had and what I did and fit it so that they should be at a level for the students.''[participants 7].* ''*First, I compare the course with my colleagues what to teach, how to teach the course so that we have the same knowledge about the course so that if a teacher has to teach the course, it will be the same because they have already concerted''[participants 9].*

Table 18. Strategies of nurse educators in overcoming challenges executing the course content for the training of pre-service competent nurse

Different strategies	Frequency	Percentage frequency	Percentage coverage
Revising course sequence	5	71.42%	44.60%
Revising course content	1	14.28%	49.56%
Adjusting teaching hours	1	14.28%	5.84%

From table 18 from our study, 71.42% participants employed the strategies to revise the course sequence with percentage coverage of 44.60% to solve the problem of inadequate arrangement of courses in the training of pre-service nurse.

C: objective 3

Other stakeholders: (policy makers, managers of nursing institutions head of departments of nursing institutions, heads of nursing associations, Regional delegate of public health).

3.3. Other Stakeholders' views about appropriate sequencing in the training of pre-service competent nurse in training institutions in the North West Region of Cameroon

Other stakeholders were interviewed to elaborate on their views and experiences about appropriate sequencing in the designing and implementing innovations in the training program for the training of pre-service nurse in training institutions in the NWR of Cameroon.

Table 19. Other Stakeholders' views about appropriate sequencing in the training of pre-service competent nurse in training institutions in the North West

Themes	Corresponding quotes
Positive views	*''The course content is scientific based, competency based and client-oriented approach.* *It is elaborated by the Ministry of Public Health and Ministry of Higher Education and sometimes they may include nurses' leaders of nursing association and sometimes they do not.'' [participants 1].* *''To elaborate on the course content, the ministry of public health is working on standards drawn by world organization and are implemented following the policy and needs of the country. The innovations are streamlined into the country's policy so the regional delegation of health is highly involved in the designing of the course content. The last course content was adopted a few months ago, in a meeting with all the directors of training schools and the regional delegate emphasised updating the course content of all the training options'' [participants 2]*

Competency based course content	*''As director of a nursing school, I took active part in the designing of a new course content in the training of nurses in Mbalmayo in March to April 2021. It was done laying emphasis on course objectives being provided to lecturers and what is expected of them following the objectives before delivery the course content to the student making sure the training process tailor to the objectives as well as the course content.'' [participants 3]* Additionally, another interviewee emphasised that the course content is designed in such a way that the students achieve competencies after completing the courses. *''It is a good experience in designing course content for the nursing program. We follow the area in which the nurses need competencies in order to serve the patient well. Each course has its own area of specialty with respect to the problems that the patients are having and the competency that the nurses need to care for the patients.'' [participants 6]*
Themes	Corresponding quotes
Integrated approach	*''In innovation the aspect of hands on practice in the demonstration room where student have to acquire all the technical instruments before the course start. The day they are proceeding to the skill lab all students are expected to come with their instruments for demonstration, so that student can match theory with practice because for the past year student spent more time on theory than practice.'' [participants 3]* Also, another interviewee said: *''My experience on the current innovations by WHO emphasis an integrated approach to learning where you have various dimensions like leadership, management, research, clinical, the ability to solve problems especially world problems emanating from diseases. So, nurses should be trained in such a way that they are able to handle, take care of some issues that are emanating from diseases that have just emerged like the corona virus pandemic. So, it should be an approach that will involve all of these.'' [participants 4]*
Need for Revision	According to some stakeholders the course content in most of the institutions were designed by government and had some gaps that needed to be reviewed. One of the interviewees stated: *''The course sequence here follows what has been given by government so we do just slight adjustment to meet students' needs'' [participants 4]* In addition, one of the interviewees emphasised that to have a competent nurse the current course sequence must be reviewed. *''To train a nurse that will be competent you need to have a review of the course sequence.'' [participants5]*

Table 20. Other stakeholders' views about appropriate sequencing in the designing and implementation of the training program in the training of pre-service nurse in the North West Region of Cameroon

Different positions	Frequency	Percentage coverage
Negative	0	0.00%
Positive	100%	100.00%

Various Views	Frequency	% frequency	Percentage coverage
Competency based approach,	2	33.33%	41.01%
Integrated approach	2	33.33%	48.36%
Need for revision	2	33.33%	10.63%

It shows that 100.00% participants with percentage coverage of 100% had positive view on the designing of the course content. It also shows that majority participants 33.33% participants with percentage coverage 48.36% viewed that an integrated approach, integrating theory with practical course as appropriate sequence in designing the course content should be adapted as one of the innovations.

Other Stakeholders' challenges about appropriate sequencing in adopting and implementing the training program for the training of pre-service competent nurse in the north west region of Cameroon

Other stakeholders were interviewed to explain the challenges and limitations they encountered about appropriate sequencing, in designing and implementing innovations in the training program in the training of pre-service nurse (see appendix ii).
Data collected was analysed using NVIVO 9 version and the following findings emerged (table 24 below). Appendix IIb

Table 21. Other Stakeholders' challenges about appropriate sequencing in adopting and implementing the training program for the training of pre-service competent nurse in the north west region of Cameroon

Themes	Corresponding quotes.
No nurse autonomy and involvement of nurse leaders in policy.	''*No nurse autonomy so, nurse organization only do registration after training by the various ministries.'' [participants 1].* ''*Nurse leaders are not involved in policy making in this way, one cannot help in the policy so that it can be adapted to nurses training.'' [participants1]* ''*There are people in the ministry of public health who are not nurse educators and also there are secondary and high school teachers who are there in the training service who decide for nurses training and this looks somehow.'' [policy maker 2]* ''*We face challenges such as few professionals to draw up the courses for the different specialties, we also face the challenges of the ministry imposing some of the content and which were not drawn up by professional in the field.''* [participants 6]
Inadequate course sequence.	''*The main challenges we discovered is that some of the training options did not go through the course sequence making it difficult for the students to assimilate the courses at the end of the school year. This can discredit a student that did not go through the course because exams are set by the ministry of public health*.'' [participants 2] ''*The running of the HND, SRN, BNS, is not harmonised. That is the course sequence is not harmonised. Sometimes you have SRN and HND students coming to do degree where some courses are taught and some are not taught in their past course contents. This is causing a big challenge in using the BScN course content and to blend it and make a c that will reflect the standard is not easy because there are not coming to do four years but one year so is challenging to design a course sequence for these students. These is because, those with SRN will do one year and write the HND and when they do like that, some of the courses which are in the HND are not in the SRN because HND is academically oriented while SRN is practice oriented and there are some basic sciences like biochemistry, chemistry, mathematics, statistics, that are in the HND that are not well*

	designed in the SRN. With the HND that we are using the national course content you have to use your initiative as an expert in the field to either harmonise the courses or add some courses to those that are deficient and these cost us a lot of time and resources because you have to add the time so that those who don't have the knowledge will be taught.''[participants 5].
	''The course sequence does not contain some of the courses involving emergent diseases. Sometimes some of the key facts may be missing because it is not part of the course content.'' [participants 5]
Themes	Corresponding quotes.
Inadequate timing (courses time scale)	*''The main challenges we discovered is that some of the training options did not go through the sequence of the school year. Also, some of the school do not exhaust the courses due to inadequate time scale''. [participants3]*
	''Some of the courses content designed are so vast making it difficult to complete the courses'' [participants 2]
Background of nurses.	*''some challenges are due to the fact that student nurses are gathered from all supplies like the art, sciences, and so, there are disparities in the course sequence and it is not meeting the objectives because there are some course sequence with the notion that, there is a science background. Most often this knowledge is not there so you need to go deeper otherwise some students will not grasp the concepts.'' [participants 4].*
	''the language is from French to English missing out vital information so, when I take a course in English, I don't understand what it means as it is translated from French to English.'' [participants 3]

Table 22. Various challenges of other stakeholders using appropriate sequencing for the training of pre-service nurse in the NWR of Cameroon

Various challenges of other stakeholders.	Frequency	Percentage coverage
Inadequate courses sequence	100%	33,33%
No involvement of nurse leaders in policy.	50%	36,58%
No nurse autonomy to design nurse training programs	50%	10.64%
Inadequate time scale	50%	19,45%
Inadequate background of nursing students	33.33%	18.17%

In table 22, 100% of participants in this study with a percentage coverage of 27-56% faced challenges implementing the courses content

Table 23. challenges for all stakeholders and percentage coverage in the training of pre-service nurse

Various Challenges	Policy makers		Managers		Nurse educators		Students	
	Frequency	% Coverage	Frequency	% Coverage	Frequency	% coverage	Frequency	% coverage
Inadequate course Sequencing	3.57%	33.33%	10.71%	27.56%	7.14%	34.81%	25%	52.97%
Inadequate Practical demonstration and limited practical courses					3.57%	20.82%	14.28%	41.83%
Inadequate timing (courses time scale)	3.57%	19.45%					7.14%	11.10%
No involvement of Nurse leaders in Policy making.	3.57%	36.58%						
No nurse autonomy in designing the nurses training programs.	3.57%	10.64%						
Inadequate background of nursing students. (inadequate entry prophile)			3.57%	54.27%				

From the table 23, we can see that the challenges of all stakeholders fall into six categories. The most frequently mentioned challenges were inadequate sequencing of courses about 33.33% coverage, inadequate timing (courses time scale), inadequate practical demonstration and limited practical courses on the training program. The least mentioned were inadequate background of nursing students. (inadequate entry prophile), non-involvement of nurse leaders in policy making.

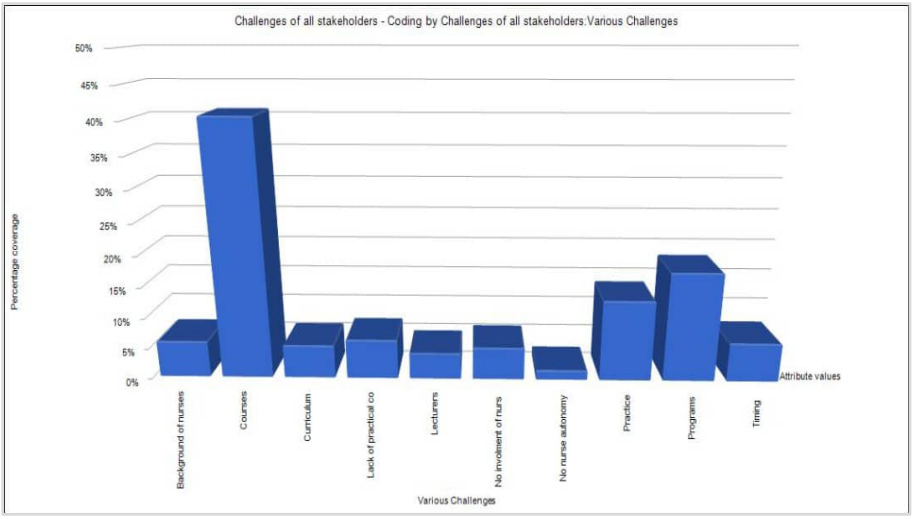

Figure 1. Challenges of all stakeholders about appropriate sequencing in the training program for the training of pre-service nurse in training nursing institution in the NWR of Cameroon

Objective 3.

Strategies of other stakeholders in overcoming challenges about appropriate sequencing in the training program for the training of pre- service nurse in training institutions in the NWR of Cameroon

Other stakeholders were interviewed about the strategies they used in overcoming challenges about appropriate sequencing in the training program for the training of pre-service nurse in nursing institutions. Data collected was analysed with NVIVO 9 and the following themes emerged appendix 1I c.

Table 24. Strategies of other stakeholders in overcoming challenges about appropriate sequencing in the training program for the training of pre- service nurse in training institutions in the NWR of Cameroon

Themes	Corresponding quotes
Program and course Sequence.	*''The minister of health for example extended the program sequence by a month so that the vast courses could be completed.'' [participants 2]* *''Sometimes we do a temporal review of the course sequence to add some courses because some students lack the necessary knowledge. Sometimes the courses are merged. In the HND you separate the courses so that they can be taught differently so that it will be easy for students to assimilate. Also since some of the courses are not well spelled out so you use your initiative or you confer with other experts to know what they are doing in other schools so that you can be able to teach your student the right thing especially the HND as they write one national certification exams.* *Sometimes we leave the courses as they come and teach them as such but sometimes, we adopt the strategy to teach all what is concerning the course especially what is important for the nurse.'' [participants 5]* *''The ministry also gives us the opportunity to review the course sequence. So, we use that as an opportunity to do lots of correction on the course content following the training that need to be done.'' [participants 6]* *''We have proposed extending lecture days for the courses.'' [participants 2]* *''Teachers should give out handouts, prepare power point presentations so that students can go through while waiting for the teachers.'' [participants 2]*
Revising course content	*''I have to verify a course read and google search when given a particular content I don't just limit myself to it. I do some background research and find out what is also important because when I read, I find out different sources of information and I make different proposal with my colleagues and I include the information. For example, when I have a part-time lecturer, I will ask them to go and draft their own content and bring so that I see what can be added to it. then I gradually see how I can adjust it.'' [participants 4]* *''As the course sequence is not specifying, the content is not very clear, what to be taught, sometimes you use your own experience and expertise to teach the student what they are supposed to know at that level.'' [participants 5]* *''We do everything to see that we even bring in professionals from far to draw up the content.''*
Nurse association Autonomy	*''Nursing organisation should have autonomy in sequencing courses in partnership with other policy makers as in other countries where they are involved in pre-service training because nurses as expert, knows what is required of nursing students'' [participants 1].*

Table 25. Strategies of other stakeholders in addressing the challenges of appropriate sequencing in the training program for the training of pre-service nurse in the NWR of Cameroon

Different strategies	Frequency	Percentage coverage
Program and course sequence	100%	43.46%
Nurse association autonomy and involvement in policy	50%	28.15%
Revising course content	50%	28.40%

Table 25, shows that 100% of participants employed extending lectures days, had the highest percentage coverage 43.46% as indicated in the analysis grid, appendix 2, meaning that majority of other stakeholders had problems with the institutions not completing their course objectives before employing this strategy of extending lectures time clearly indicating inappropriate time scale in the course sequence..

Table 26. Various strategies of stakeholders about appropriate sequencing in the training program for the training of pre-service nurse in the NWR of Cameroon

Various strategies	Frequency	Percentage coverage
Positive behaviour of students	10	13.96%
Nurse association autonomy	1	2.03%
Improving practice	5	13.20%
Revising course content	8	29.48%
Program and course sequence	2	4.09%

From table 26, it shows that majority stakeholders (34.14%) are for the opinion of training program revision and (29,48%) for course content revision.

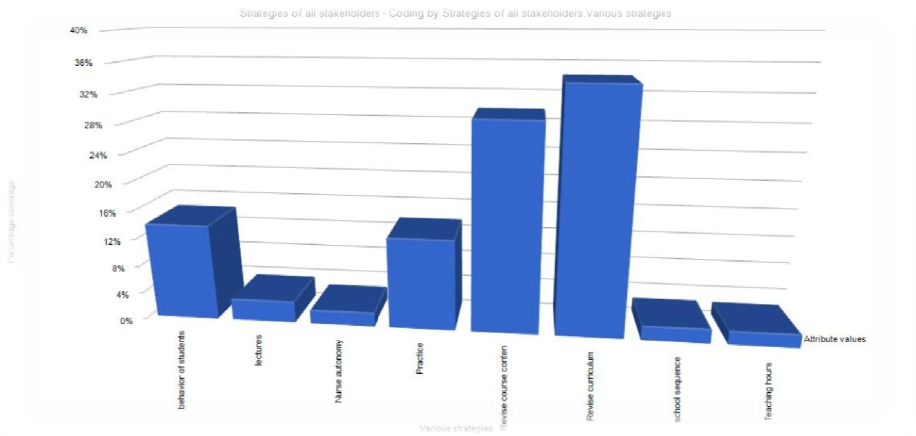

Figure 2. All stakeholders views about appropriate sequencing in designing and implementing innovations in the training program for the training of pre-service nurse

From fig 2, we can see that most stakeholders were for the opinion of training program revision with a percentage coverage of 35. 6% which means innovations are highly needed in the training program.Also, in terms of course content sequencing most stakeholders were for course content revision with a percentage coverage of 28.1%. some stakeholders as seen in this figure recommended that practical courses, practical demonstration should be included in the training program.

D: Objective 4

3.4. Pertinent results from triangulation of data and uptake measures

These findings were gathered from triangulation made through the whole project from introduction, literature review. Also form participants through questionnaires and interview.

Table 27A. Result and uptake measures

Results from Triangulation	Content	Uptake measures
1). Inequitable time between theory and practice, long duration of theory and short period for clinical	I) Majority students viewed that the time allocated for theoretical courses is very long such that students do not have much time to practice in clinical sites immediately after they finish each course (33.2%). The separation or gap between theoretical science and clinical care can be defined as a mismatch between what nursing students learn in the classroom and what they experience in a clinical setting [363]. II)Students view of a time lag between theoretical and immediate practical course and clinical after each course, point to the existence of a gap between theory and practice. This is Similar to studies by [364] that also showed the existence of this gap.	1). The nursing education training program should be sequenced, revised to fill the gap between the theoretical and practical aspects. II). The time lapses between the learned topics and apprenticeship should be sequenced, shortened, giving students enough time to integrate the theoretical topics.
II) Lack of practical demonstration courses in the training program.	II) Students views are that theory does not match with practice and if there are no practical courses in the training program, it means there is a deficient in practical experience. This is in line with studies by WHO and other partners between 2008 to 2013 in assessment of nursing institutions which revealed the lack of balance between theory and practice including absence of clinical courses and related clinical competencies to link theory with practice [365]. Most of the courses in the Training program are in such a way that learners are not provided with theory which is immediately followed by a clinical course to allow for adequate exposure to experiential learning.	II) The training program should be revised such that all courses necessary for training pre-service competent nurses are included.
Results from Triangulation	Content	Uptake measures
I)No perfect match between theoretical and practical courses. No perfect match between theoretical and practical courses.	I) Majority students (43.7%) agreed that there is no perfect match between theoretical courses and clinical courses in the training program for the pre-service training of competent nurses. -Theory and clinical courses allow students to practice some competencies in the clinical skills laboratory, a safe and comfortable environment to develop confidence before they learn through providing care to real patients.	I) Courses should be structured in a way That presents learners with opportunities to gain increasingly more analytical and critical thinking skills that can be applied to nursing practice.
Inadequate sequencing of courses in the training program.	I). Most population of students (40.5%) view that there are some courses in the course content that were to be taught before other courses. II). Majority population of the students (42.9%) also believe that some courses which were supposed to be in the training program are left out. This is in line with other studies conducted by WHO and other partners in 2008 to 2013 revealed that there are no clear linkages between content and programme objectives/ learning outcomes and lack/complete absence of relevant and current training materials in most educational institutions [366]. The need for the course content sequencing and sequence is further highlighted in a study by [367] suggesting that assessment tasks and the training program determine student learning activities and interest.	I). Courses that are introduced early in the programme should be sequenced in way that the courses are applied in almost every subsequent learning experience. II). The courses should be sequenced in such a way that during their first-year, learners obtain a sound foundation from biomedical and behaviour sciences.

Table 27B. Result and uptake measures

Population	Results from Triangulation	Content	Uptake measures
Nurse Educators (stakeholders 2) Nurse educators	Inadequate Course sequence Inadequate course sequence	i) Limited course sequenced in such a way that during their first year they can obtain a sound foundation from sciences subject which can provide them with knowledge, skills for understanding the scientific base of the practice of nursing. ii). Inadequate course sequence in a way that cannot presents students with opportunities to gain increasingly more analytical and critical thinking skills that can be applied to nursing practice. iii). Most of the nurse educators (50%) were dissatisfied with the Sequence of courses as they sometimes decide to teach a particular content before another even though it has been arranged differently in the content. So, the courses are not well sequenced to meet the need of the instructor and the students.	I)The courses should be sequenced in such a way that during their first-year, learners obtain a sound foundation from biomedical and behaviour sciences. II) Courses that are introduced early in the programme should be sequenced in way that the courses are applied in almost every subsequent learning experience.
Nurse educators (Stakeholders 2)	I). Mismatch/Inadequate practical Demonstration Courses. II) Mismatch/Inadequate practical demonstration courses mismatch/inadequate practical demonstration III) mismatch/inadequate practical demonstration courses	I)Most nurse educators (41.7%) also view that there are some contents which ought to be in the syllabus, but are absent. II). Majority nurse educators confer that courses which ought to come before others so that the students have basic foundation before other courses but these courses come after. For example, research in nursing project, is the first course when student have not yet mastered any basic knowledge of the nursing profession. Studies in other countries have also identified a gap between theoretical learning and clinical nursing services to be caused by defects in course sequence amongst other factors [368]. III). Most nurse educators 42.85% complained of lapses in relation to the courses in the sense that there are some aspects in the courses that are to be taught practically to augment the teaching that has been done. The lapses are due to inadequate demonstration courses in the training program, practical equipment that are to be used are not available one can't meet up with the level that they are supposed to be.'' [participants 9]	I). The nursing education training program should be sequenced, revised to fill the gap between the theoretical and practical aspects. II). The time lapses between the learned topics and apprenticeship should be sequenced, shortened, giving students enough time to integrate the theoretical topics into their practical skills. III). The time ratio of 1:2 for theory and practice as in the competency-based training program stipulated by WHO should be maintained, so as to allocate extra time for students for private practice o be applied to nursing practice.

Table 27 C. Result and uptake measures

Results from Triangulation	Content	Uptake measures
I). Inadequate course content/course sequence.	I) Majority of stakeholders had challenges with courses ranging from; Policy makers main challenge is that some of the training options do not go through the program sequence making it difficult to complete the courses at the end of the school year. This can discredit a student that did not go through the course because exams are set by the ministry of public health. Direct translation of courses from French to English leaving out vital information, training program courses are shallow and are not drawn by professionals. These renders it difficult for managers to implement the programs. On the part of nurse educators as stakeholders, they encountered challenges with courses giving a 54.81%. Nurse educators in executing the training program also face problems of inadequate course content direct translation from French to English For students in this study, using the training program, they faced many challenges with the courses giving a percentage coverage of 52.95% The challenges ranges from, lack of some courses, non-accomplishment of courses before clinicals and examinations, too many courses, no demonstration courses, no detailed course content.	I)There should be appropriate course content sequencing
II) Inadequate Practical demonstration courses in the training program	II) Majority other stakeholders view that theoretical courses are not immediately followed by clinical courses to allow for exposure to experiential learning, and to practise some competencies in the clinical skills laboratory, to develop confidence before they can provide care to real patients. Also, there are some courses that are not elaborated and I may not understand how to get information and some important issues that one need to add, so much such that when one teaches that course now and some other person wants to teach the course, may not be the same. So, the information will not be coherent because one has an idea on what one is about to teach and some other person has his own. The results from this study shows nurse instructors had challenges using the training program which is a factor for a theory practice gap as the student learn the theory and lack practical demonstration in skill lab, limited confidence to practice on real patients. Also, limited practical courses in the training program students have to finish theory and by the time they go for clinical they have forgotten the theory and will be embarrassed in the wards.	II) Practical demonstration courses should be included in the training program Training program should be revised to fill the gap between theoretical and practical aspect
III) Inadequate Timing	III) Most stakeholders 50% had main challenges of inadequate timing that some of the training options did not go through the program sequence of the school year. Also, some of the school do not exhaust the training program due to time limitation or late start. Also, disparities in the time lapse between theory and practicebecause some courses were taught for longer periods and others that is, the time given for theoretical course is too long compared to the time for clinical experience. This means there is a discrepancy between the time lag between theory and practice. This is in line with other studies by [368] that showed the existence of this gap. Studies in other countries have also identified a gap between theoretical learning and clinical nursing services to be caused by, defects in training program planning among other factors [369]. This shows that, a high proportion of time is allocated to memorizing large amounts of information that does not match the clinical requirements. The ratio for theory and practice are 1:2.	III) Adequate timescale should be made between theory and practice. The time lapses between the learned topics and apprenticeship should be shortened giving students enough time to integrate the theoretical topics into their practical skills.
IV). No nurse autonomy	IV) Most stakeholders pointed to none existence of nurse autonomy so, nurse organization only do registration after training by the various ministries. As such cannot influence innovations in the training program such as course content sequencing.	IV) Nurses should have autonomy so that they can advocate for appropriate sequencing of course in the training program
V). No Nurse Leader involvementin policy.	V) Some stakeholders 50% pointed to the fact that nurse leaders are not involved in policy making. since policies significantly impact the performance of the nursing education system, nurse leaders' involvement in applying innovative educational approaches such as sequencing need to be congruent with the legislations. This might be a kind of guarantee for training pre-service competent nurse.	V) Nurse leaders and head of nursing associations should be involved in policy making so that they can be involved in designing the training program.

E. objective 5

3.5 A sequenced model strategy for training pre-service nurse

This model is based on uptake measures from findings in this study, through triangulation from introduction, literature review, students, nurse educators, and other stakeholders' views, challenges encountered and strategies adopted to overcome challenges about appropriate sequencing in the training program. This model strategy is focused on revising the sequencing of courses, time sequence and apprenticeship period. It also brings out the rationale and importance of each element and the competencies required.

Table 28A. Sequence model strategy

Strategy	Strategic measures	Rationale	Importance
Revising course Sequence	I) Propose that the course sequence should be rearranged. This is because as the present training model is structured according to semester, there are some courses that are to be taught before others but are sometimes misplaced within the course sequence. So we have to sit and rearrange to come up with a programme such that if the content says we have to teach a course in the second semester and we realise that it is a first semester course we have to bring it to the first semester and take the other course to the second semester. For example research in nursing which is a final year course, is taught in the first year when students have not yet mastered basics concepts in nursing, should be taken to the final year. This should be done such that at the end of the training program the courses are taught. Each course should be sequenced such that the objectives, its course content, are clearly stated to address issues of difficult courses and for students to work ahead of time.	I) This will align the courses so that the content progresses from easy to hard topics and in a chronological manner. II)This enable Students apprehend courses and work ahead. Also, it harmonises teaching III) This Permit students have adequate exposure to experiential learning.	I) This ease students understanding. II) This provide students With confidence and adequate exposure to experience in clinical sites without embarrassments. Graduates will gain skills, competency and dexterity III) This allow Students gain competencies to make sound judgments and decisions in clinical care.
Revising course Sequence	II) We also propose that some practical coursesbe sequenced as to match clinical practice with theory because in the prevailing model, the training program has limited practical courses that directly match with theory. Courses should be sequenced such that clinical courses are immediately followed by clinical demonstration in clinical laboratory before internship. This is because in the present training program, there are long period of theoretical courses and practical courses before internship,	It acts as a base for other courses. IV) This allows theory match with clinical.	This links the courses and there is coherence. This ease students understanding. IV) This is of relevance as it Provides students with the ability to have critical analyses of clinical program.
Revising course Sequence	III) Courses should be sequenced in such a way that provides students with knowledge, skills for understanding basic concepts of nursing practice. Courses that are introduced early in the programme should be in way that is applied in subsequent courses. This is because in the present model, there are courses which ought to come before others so that the students have basic foundation before other courses but these courses come after. For example, research in nursing project, is the first course when student have not yet mastered any basic knowledge of the nursing profession.		
Revising course Sequence	IV) Also, the courses should be sequenced in such a way that planned learning experience can be applied in clinical sites.		

Table 28B. Sequence model strategy (Continued)

Strategy	Strategic measures	Rational	Importance
Program and timescale sequencing	V) The training program should be sequenced, revised to fill the gap between the theoretical and practical aspects.We could readjust the teaching hours to suit the course so that the student gets the competencies required. This is because in the present training model, the training options did not go through the course sequence making it difficult for the students to assimilate the courses at the end of the school year. This can discredit a student that did not go through the course because exams are set by the ministry of public health. The time lapses between the learned topics and practical should be shortened. In the present model, we have a problem of time spacing that is, the time given for theoretical course is too long compared to the time for clinical experience. Nurses should have autonomy so that they can advocate for appropriate sequencing of course in the training program. Nurse leaders and head of nursing associations should be involved in policy making so that they can be involved in designing the training program.	V) This allows the school sequence goes through the academic year. It permits Students have enough time to Integrate the theoretical topics into their practical skills.	V) This is important as it will lead to the completion of courses and accomplishment of course objectives.
Improving apprenticeship Period	VI) The time lapses between the learned topics and apprenticeship should be sequenced, shortened, giving students enough time to integrate the theoretical topics into their practical skills. In the prevailing model, the time lag between theory and apprenticeship is long as students said most of their time is spent memorising large volume of work before internship. Apprenticeship period should be short such that one month after theoretical course and clinical laboratory, is followed by internship in clinical sites. This model based on findings from this study, proposes that the inconsistency of apprenticeship period be adjusted.	VI) It minimizes the theory practice gap.	VI) Early apprenticeships will permit graduates to have, practical skills, dexterity and confidence to solve problems that arise in clinical sites.

With regards to school programs to run smoothly and overcome the challenge of a bulky school programme and vast courses, data collected from this study show that stakeholders employed some measures such as extending the school sequence for some months to complete courses, as stated by one of the interviewees:

''The minister of health for example extend the school sequence by a month so that the vast courses could be completed.'' [participants 2]

Managers used their expertise and experiences to either separate, merge or consult other experts and colleagues in other institutions to fill up the gaps and ensure student are taught the same contents because the same general certification examination is written. One of the interviewees stated.

''Sometimes we do a temporal review of the training program to add some courses because some students lack the necessary knowledge. Sometimes the courses are merged. In the HND you separate the courses so that they can be taught differently so that it will be easy for students to assimilate. Also since some of the courses are not well spelled out so you use your initiative or you confer with other experts to know what they are doing in other schools so that you can be able to teach your student the right thing especially the HND as they write one national certification exams.

Data collected from this study shows that nurse educators used several strategies to align the courses so that the training program progresses from easy to hard topics and in a chronological manner to ease students understanding. One of the interviewees elaborated:

''As a nurse educator experienced in the field, I have to sit and rearrange the courses because as it is structured according to semester, there are some courses that are to be taught before others but are sometimes misplaced within the training program. So we have to sit and rearrange to come up with an internalized programme such that if the training program says I have to teach a course in the second semester and I realise that it is a first semester course I have to bring it to the first semester and take another course to the second semester. This is done such that at the end of the 3 years all the courses are taught.'' [participants 12]
In addition,

''We also arrange it in such a way that makes understanding easier for the student. Also, if I realise that a topic is to be taught before another in the same semester, I will teach course 2 before course 1 depending on how I see it so that the materials flow comprehensively for the student.'' [nurse educator 12]

With regards to past experience of theoretical and practical knowledge, data collected show that some nurse educators could put the courses in sequence so that theory and practice match before execution.

From our study 71.42% participants employed the strategies to revise the course content with percentage coverage of 44.60% to solve the problem of haphazard arrangement of courses in the training program. Therefore, there is need for appropriate sequencing in the training program of the various training institutions

However, information gathered in this study, reveal that students made some recommendations on course content sequencing and courses in general as one of the students said,

''I propose that practical courses be included in the training program to match clinical practice with theory.'' *[participants 21].*

Furthermore, another student emphasised the inclusion of practical courses in the training program.

''I also propose that they should include practical course in the training program.'' [participants 23].

These recommendations from our study by students revealed that most programmes in the training institutions need appropriate sequencing to meet the training of competent nurses. Majority of the students also strongly agreed 161(42.4%) that content of the training program is structured orderly such that all theoretical courses come before practical courses. Most of the students also agreed (40.5%) that some courses in the course content that were supposed to be taught before other courses. From all these scenarios, it shows the absolute need for appropriate sequencing of courses for the training of pre-service competent nurse in the North West Region of Cameroon.

Cognitive learning theory takes a constructivist perspective for learning. This theoretical framework is particularly well suited for explaining the competency-based approach with emphasis on sequencing, to nursing education. The constructivist view in learning is a lifelong process, learning is contextual, and new knowledge builds on previous knowledge.
The competency-based method to nursing education is not just a way to approach content, but sequencing and also requires a shift in teaching strategies. Constructivism provides the theoretical foundation for the competency-based approach to training preservice nurse.

Social learning theory, particularly the component of self-efficacy, is relevant to nursing education and student perceptions of their role in the learning process. Nursing students must be able to translate knowledge into practice and due to the dynamic nature of healthcare must be lifelong learners. In addition, it is essential that nursing students believe they are able to master the knowledge and skills required to complete a nursing education program successfully and to be prepared for beginning a professional nursing practice. Apprenticeship is a core concept of situated learning, or situated cognition. In the prevailing model, apprenticeship period is long as students said most of their time is spent memorizing large volume of work before internship in the community.

So, the apprenticeship period should be short such that students go for internship within one month after theoretical courses, have enough time to integrate theoretical courses into practical skills. Students in this present study agreed that they spent more time doing theory before practical. The concept of apprenticeship supports the perspective that learning involves social participation; learning requires individuals to practice activities within the context of the culture and the practice community in which they desire to become an active member. The development of a course sequence model strategy for training pre-service nurse takes into premise Lave and Wenger's situated learning constructs as the students apply knowledge and skills to practice, and the socialization in the community of professional nursing practice. This is the main characteristic of this course sequenced model strategy.

Summary of findings

Summary of findings Section A	
Study objectives	Findings
To analyse nursing students' views in their training using appropriate sequencing in training institution in the North West Region of Cameroon.	Most of the students agreed (40.5%) that some courses in the course content were supposed to be taught before other courses. According to the students, time allocated for theoretical courses is very long such that students do not have much time to practice in clinical sites immediately after they finish each course (53.2%). Majority of the female students (61%) agreed on the program meeting the needs of the training, compared to the male counterpart (26%). The difference was statistically significant (P=0.012). ''They structure our program in such a way that we finish all our courses for the semester before we go for internship because there are some courses that are linked to practical such as dental care so that we will not be surprised when we get to the field.''[student nurse 15]. ''The training program is structured in such a way that the teacher teaches all the courses before students go for clinical experience Majority students 50% participants with a percentage coverage of 51.95% had negative views on course sequencing Students faced many challenges about appropriate sequencing giving a percentage coverage of 52.95%. The challenges ranges from; Inadequate sequencing of courses in the program 52% Limited practice after each theoretical course 28.5% Inadequate time scale between courses. 7'14% Students adopted some strategies to overcome challenges about appropriate sequencing in their training in training institutions in the NWR of Cameroon. Positive behavior of students 66.6% Improving nursing practice 33.33%
Summary Finding Section B	
To analyse Nurse educators' views in the raining of pre-service nurse using appropriate sequencing in Training institutions in the NWR of Cameroon.	Most of them also agreed that they sometimes decide to teach a particular content before another even though it has been arranged differently in the content (50%). Majority of the educators also agreed strongly that there is some content which ought to be in the syllabus, but it is absent (41.7%). According to the educators, student nurses are well grounded in theory before clinical experience. Findings also showed that nurse educators faced the following challenges in the training of pre-service competent nurse using appropriate sequencing in training institution in the NWR of Cameroon Inadequate timing/timescale had percentage frequency of 28.57% and percentage coverage of 34-81%. Inadequate course sequencing had percentage frequency 57.45% and percentage coverage of 44.36%. Limited practical courses had percentage frequency of 14.28% and percentage coverage of 20.82%. Strategies of nurse educators in overcoming challenges executing the course content for the training of pre-service competent nurse. Revising course sequence, percentage frequency of 71.42% and Percentage coverage of 44.60%. Revising course content, percentage frequency 14.28% and Percentage coverage of 49.56%. Adjusting teaching hours, percentage frequency 14.28% and Percentage coverage 5.84%. *Findings revealed stakeholders' views about appropriate sequencing in the designing and implementation of the training program in the training of pre-service nurse in the North West Region of Cameroon.* Competency based approach with percentage frequency of 33.33% and percentage coverage of 41.5% Integrated approach (integrating theory and practice) with percentage frequency of 33.33% and percentage coverage of 48.36%. Need for training program revision with percentage frequency of 33.33% and percentage coverage of 10.63%.
To investigate the views of other stakeholders in the training of pre-service nurse using Appropriate sequencing in training institution in the NWR of Cameroon.	Findings showed that other stakeholders faced the following challenges about appropriate sequencing in adopting and implementing the training program for the training of pre-service competent nurse in the north west regionof Cameroon. Inadequate courses sequence with percentage frequency of 100% and percentage coverage of 33,33%. No involvement of nurse leaders in policy with percentage frequency of 50% and percentage coverage of 36,58%. No nurse autonomy to design nurse training programs with percentage frequency of 50% and percentage coverage of 10.64%. Inadequate time scale with percentage frequency of 50% and Percentage coverage of 19,45%. Inadequate background of nursing students with percentage frequency of 33.33% and percentage coverage of 18.17%. *Strategies of other stakeholders in addressing the challenges of appropriate sequencing in the training program for the training of pre-service nurse in the NWR of Cameroon.* Program and course sequencing had percentage frequency of 100% and percentage coverage of 43.46%. Nurse association autonomy and involvement in policy had percentage frequency of 50% and percentage coverage of 28.15%. Revising course content had percentage frequency of 50% and percentage coverage of 28.40% (see analysis grid appendix iv).

4. DISCUSSION CONCLUSION AND RECOMMENDATIONS

4.1. Discussion

Discussion covers an overview of the views of respondents on the training of pre-service nurse and challenges. The arguments are from the constructivist social and situated learning theories interpretation of the research findings presented in chapter four. Then, a brief conclusion and recommendation.

Research objective one: to analyze views of students in their training using appropriate sequencing in training institution in the North West Region of Cameroon

Majority of the respondents were females (83%) and 17% of males. According to the schools that were sampled, majority of the respondents came from institutes A (28.7%), followed by B (25.8%) and institute C (24.7%) and D (7.4%). The sample size varied according to the population of the institution. According to the result, majority of the students (76.3%) came from privately owned institutions, while only 15% were from government owned institution. This is because there are few government institutions compared to many private institutions. There was inadequate sequencing of courses in the training program. Most of the students agreed (40.5%) that there are some courses in the course content that were supposed to be taught before other courses. Based on the result, majority of the students (42.9%) also believed that some courses which were supposed to be in the training program were left out so, the training program in these aspects had some gaps that cannot satisfy the training of pre- service competent nurses. Also, inadequate time scale between courses and limited practice after each theoretical course. According to student's views, they disagreed with the time allocated for theoretical courses as the time was very long such that students do not have much time to practice in clinical site after they finish each course (33.2%).

The separation or gap between theoretical science and clinical care can be defined as a mismatch between what nursing students learn in the classroom and what they experience in a clinical setting [66]. The existence of a gap between theory and practice in nursing education and training of pre-service nurse is a long-standing problem, and the lag and discrepancy between the theoretical and clinical aspects of nursing education have caused much concern among nursing students [67]. Most students in this study, disagreed to the short time period of theoretical courses and the immediate clinical after they finish each course, pointed to the existence of a gap between theory and practice**.** Similar studies by [68] also showed the existence of this gap. This suggests that the nursing education training program should be revised to fill the gap between the theoretical and practical aspects, and that the time lapse between the learned topicsand apprenticeship should be shortened, to give students enough time to integrate the theoretical topics into their practical skills. Apprenticeship is a core concept of situated learning, or situated cognition. The concept of apprenticeship supports the perspective that learning involves social participation; learning requires individuals to practice activities within the context of the culture and the practice community in which they desire to become an active member [69]. Apprenticeship as a strategy for training pre-service nurse takes into premise Lave and Wenger's situated learning constructs as the students apply knowledge and skills to practice, and the socialization in the community of professional nursing practice. Students' views generally showed that, a high proportion of their time was allocated to memorizing large amounts of information that did not match the clinical requirements. This is because students in this study, commented that they had long period of theory than clinical and what they see in clinical site is not what they were taught and is like they are doing two different version of theoretical and practical nursing. Studies in other countries have also identified a gap between theoretical learning and clinical nursing services to be caused by, defects in training program planning among other factors [70].There is need for the courses to be well sequenced and aligned in such a way that each theoretical course is followed immediately by a practical course. Studies conducted by WHO and other partners, between 2008 – 2013, revealed that great variations between theoretical and clinical courses. Students in this study agreed (43.7%) that there is no perfect match between theoretical courses and clinical courses in the training program for the pre-service training of competent nurses. Variation exists among countries with regard to training program orientations which should guide implementation of planned learning experiences. As a practical profession, nursing requires training based on a theoretical framework that allows students to learn the clinical skills that are essential for the care of patients [71].

However, many studies confirm that today the knowledge provided in the classroom is different from the clinical care [72] and there is a relatively deep gap in the educational process of nursing and the clinical performance of the students [73]. According to Elahi, studies in Iran suggest that theoretical training is not practical [74]. Also, [75] has stated that existing clinical education does not provide the student with the ability to express clinical skills. Nursing leaders claim that there are a large number of nursing graduates who are theoretically competent but lack some clinical skills [76]. Many studies have indicated a need for the nursing education system to keep pace with continuous changes in nursing practice. The literature suggests that the results of apprenticeship are not satisfactory, which indicate the need for more attention to this aspect [77]. Studies have shown that, although new nursing graduates possess a strong theoretical background and knowledge, they don't have the necessary skills and dexterity which are required to solve problems that arise in clinical settings. Some studies have also indicated that, there is a vast gap between classical nursing education and clinical care performance, suggesting that the present clinical education system does not provide students with the necessary clinical skills [78]. Studies on various clinical aspects indicate that students consider the quality of the education to be unsatisfactory. Reported deficits were including, inconsistency of apprenticeships in clinical wards and a lack of congruence between theoretical learning and the clinical nursing services [79].

Research objective 2: To analyse the views of nurse educators, stakeholders 2 for the training of pre-service competent nurse using appropriate sequencing in the North West Region of Cameroon

Findings revealed inadequate course sequencing as most of the nurse educators (57.14%) disagreed that the course content does not meet the training of competent nurse at international standards. Most of the nurse educator disagreed with the training program as they agreed that they sometimes decide to teach a particular content before another even though it has been arranged differently in the content (50%). So, the courses are not well sequenced to meet the need of the instructor and the students. Nurse educators also agreed strongly that there are some contents which ought to be in the syllabus, but it is absent (41.7%). Non applicability of some topics. From these findings, it shows a mismatch of courses in the training program. Studies in other countries have also identified a gap between theoretical learning and clinical nursing services is caused by defects in training program, inappropriate sequencing, amongst other factors [80]. Studies carried out suggest that changes in educational strategies in both theoretical and clinical situations are required [81]. Yamani et al. showed that, applying active educational solutions, and matching the theoretical education to professional needs in the training program, applying appropriate sequencing, could improve the nursing education.

Results have revealed inadequate timing/timescale between courses. According to the educators, in this study, student nurses are well grounded in theory before going for clinical experience (58.3%). According to the nurse educators, students finish all theory before going for internship in clinical sites. Therefore, the period between theory and practice is very wide and by the time the students go for internship they have forgotten most of the theoretical aspects. Therefore, there is a theory practice gap caused partially by the defects in sequencing of timescale between the courses. Similar findings by [81]in a qualitative study assessing the quality of nursing education in Iran were observed. Most nurse educators agreed that the time lag between theory and clinical laboratory and practice environment is adequate for each course (41.7%), but up to 33.3% disagree on that fact. Nurses are confronted to provide equitable, effective, affordable, and high-quality training services. Many researchers have found that a gap between theory and practice in nursing does exist [82], as well as the area that can be improved [83]. The results of this study revealed that there is a gap between theory and practice in training pre-service nurse, which were related to late clinical setting due to inappropriate sequencing of the training program. The studies of [84] and support that educators of nursing theory must constantly monitor clinical practice and re-evaluate the training program to ensure that appropriate sequencing of courses, time, necessary knowledge and skills for successful practice are included in the training program and achieved from the educational program before internship. Other studies [85] supports that the clinical practice is an area that allows students to have direct experience with the real world of nursing, this is where social learning theory, particularly the component of self-efficacy, is relevant to nursing education and student perceptions of their role in the learning process. Nursing students must be able to translate knowledge into practice and due to the dynamic nature of healthcare must be lifelong learners. In addition, it is essential that nursing students believe they are able to master the knowledge and skills required to complete a nursing education program successfully and to be prepared for beginning a professional nursing practice. Apprenticeship is a core concept of situated learning, or situated cognition. The concept of apprenticeship supports the perspective that learning involves social participation; learning requires individuals to practice activities within the context of the culture and the practice community in which they desire to become an active member. The development of a course sequence model strategy for training pre-service nurse takes into premise Lave and Wenger's situated learning constructs as the students apply knowledge and skills to practice, and the socialization in the community of professional nursing practice, which is the main characteristic of the competency based sequenced model. To address the challenges highlighted, competency-based education has been introduced into nursing programs. Competency-based requires the analysis of relevant and current environment and needs from which they determine content and competencies to be achieved in the instructional program. This provides a foundation of the competency outcomes together with the interactive practice and the clinical skills required for the job and to learn the general nursing routines and responsibilities.

Inadequate practical demonstration courses. On the other hand, studies by [86] states that practical demonstration after theory such as simulation courses should be appropriately sequenced and included in the training program and practicum that will be useful in preparing student nurses for clinical work. In this study, most of the participants show that the process of orientation to the place of training, availability of clinical demonstration labs, will positively contribute to bridge the gap and thus enhance clinical learning environment, helping in reducing the gap. Additionally, facilities will enable clinical training to take place. Also, the fact that these nurse educators agree that the students are well grounded in theory before going for internship shows that the time lag between theory, practice laboratory and clinical site is not adequately sequenced and theory is not matched immediately by practical course. There is therefore, inadequate practical demonstration. Students therefore spent time memorizing large volume of theoretical information. According to the nurse educators, the institution training program is well structured to meet standards for the training of pre-service competent nurses (75%). There are also differences in the views of the educators from different institutions, but the differences are not statistically significant as P-Values are all greater than 0.05 (Table 7).

Research objective 3: To analyse other stakeholders views in the training of pre-service competent nurse using appropriate sequencing in training institution in the North West Region of Cameroon.

According to some stakeholders, the existing training program is competency based and most often elaborated by the ministry of health and that of higher education and seldom include nursing leaders. Therefore, strategies such as course sequencing in the training program are not influenced by nurse leaders. Nurses associations and nurse leaders do not have autonomy to influence changes in the training program. Nurses command expert knowledge based on their education and experience that could contribute positively towards improving all spheres of nursing training. When nurses are involved and successfully influence health policy development, there are clear benefits to the patient, the profession and the nurse. Nurses' involvement in health policy

development ensures adequate training that training is safe, of a high quality. Although the goal of nursing education is to train skilled and experienced nurses who are capable of caring for patients in clinical environments, the present training does not equip students with decision-making skills. Nursing education thus needs to focus on strategies that encourage problem solving skills and develop critical thinking potential. The nature of the nursing profession requires nurses to have a real understanding of the subjects and to be able to apply the theories in practical situations. Some studies indicated that active training significantly promoted deep-thinking skills, as well as perpetuating the learned subjects in students' minds.Studies which were carried out about nursing education in Iran showed that the instructors and trainers (key stakeholders) play a pivotal role [87]. The results of this present study identified, numerous challenges with the courses, course contents such as, absence of some courses, inadequate arrangement of some courses, large volume of work, limited practical demonstration courses, inadequate course sequence, lack of adequate timing, leading to insufficient knowledge, and suitable clinical backgrounds as obstacles and limitations. These suggest that changes in educational strategies are required, in both theoretical and clinical situations. Yamani et al. showed that matching the theoretical education to professional needs could improve the nursing education. Therefore, there is need for course content sequencing in the training program as one of the strategies to improve students training. One study identified a lack of suitable educational equipment and facilities as a clinical education problem [87]. The new advances in healthcare delivery systems and the need for parallel improvements in nursing roles led to the introduction of major innovations such as sequencing in nursing education training program in some parts of the world. Thus, appropriate sequencing was brought as a result of the existence of the theory practice gap that were intended, among other things, to help bridge the gap between theory and practice. One of the reforms included the shift in nursing education from the traditional hospital-based training into higher education institutions. This shift showed that the rapid integration of nursing programmes into the higher educational institutions had a negative impact on the content and structure of the nursing training program. Findings from this study suggest nursing education in the research setting may be undergoing a similar transition. The design and implementation of educational programmes to achieve and maintain a thorough integration of theoretical knowledge and practical skills has been a challenge for nurse faculty and other stakeholders in nursing education. As it may appear, a clear definition and understanding of learning outcomes is the central element of any educational design and implementation strategy. Learning activities, clinical learning environment and assessment tasks need to reflect the learning outcomes to motivate students to learn and ensure knowledge transfer. The need for the course content sequencing and sequence is further highlighted in a study by [88] suggesting that assessment tasks and the training program determine student learning activities and interest.

Inadequate program and course sequence. The training program widely adopted for nursing education in the research setting focus on a constructivist theory suited competency-based profile. However, the programme outcomes are not competency-based outcomes. Aside personal attributes, the low level of motivation of students towards learning activities may be related to the lack of constructive course content sequencing, sequence between learning outcomes and learning activities. From all these scenarios, it shows the need for appropriate sequencing of courses for the training of pre-service competent nurse in the North West Region of Cameroon. Cognitive learning theory takes a constructivist perspective for learning. This theoretical framework is particularly well suited for explaining the competency-based strategy with emphasis on sequencing, to nursing education. The constructivist view in learning is a lifelong process, learning is contextual, and new knowledge builds on previous knowledge. Although job security and personal rewards are amongst the foremost reasons for choosing nursing as a career, the long-term impact of decisions rooted in these motivations on student conduct and attitudes towards learning has not been established. Innovative strategies such as course content sequencing may boost the attitude of prospective students attracted to the profession of nursing. Traditional approaches in the training program, predominantly promote rote learning rather than critical thinking and problem-solving [89]. Problem-based training, compared with the traditional training method, has been shown to be a more effective strategy in increasing the level of knowledge and attitudes of students towards training [90].

This appears not to be the participants in this research setting. Participants in this study expressed long duration of theory before clinical which because by the time the students go for clinical, which can cause the theory practice gap because by the time the students go for clinical, they may have forgotten some aspects of nursing practice. With the WHO recommendations theory should be immediately followed by clinical experience hence there is need for appropriate sequencing. In a study designed to observe and understand the transition process from post qualification to actual nursing practice, it was suggested that the differences in ideals and values pertaining to nursing as it is being taught and the reality of nursing in practice settings, contribute to the perpetuation of the theory practice gap [91]. Despite limitation in practical demonstration equipment and other elements, stakeholders who participated in this study were willing to help in the designing of the training program to facilitate clinical learning if they were duly recognized. It can be argued that the theory practice gap in the research setting was largely due to the failure of stakeholders in nursing education to clearly define the course content, learning outcomes and has outcomes aligned and well sequenced with learning activities occurring within the training program. If learning outcomes and course contents are well aligned with practical in the training program it will provide opportunities for students to knowledge, engage new information, demonstrate competence and apply skills in the real world [92].

Findings also showed inadequate timing (courses time scale) in the training program as some participants commented ''The main challenges discovered was that some of the training options did not go through the sequence of the school year. Also, some of the schools did not exhaust the courses due to inadequate time scale''. With regards to school sequence to run smoothly and overcome the challenge of uncompleted courses due to inadequate sequencing, measures extending the school sequence for some months to complete courses is a good strategy but for how long should we be extending the academic year. There is therefore need for appropriate sequencing to address these challenges. When there is appropriate sequencing, there will be no time lapse in the training of nurses per year.

Research objective 4: To propose uptake measures in the training of pre-service competent nurses in training institutions in the North West Region of Cameroon

The nursing education training program should be sequenced, such that the time lapse between the learned topics and apprenticeship, are shortened, giving students enough time to integrate the theoretical topics into practice. This is because most study participants viewed that the space between theory and practice was insufficient for theoretical courses as students do not have much time for practicum after theory. Study participant's view of a time lag between theoretical and immediate practical course and clinical experience, point to the existence of a theory practice gap. This is similar to studies by [93] that also showed the existence of this gap. They should be revision of the training program such that there is inclusion of all courses necessary for training pre-service competent nurses. Most of the study subjects viewed that some of the theoretical courses in the prevailing program are not immediately followed by clinical courses to allow for adequate exposure to experiential learning. This is in line with studies by WHO and other partners between 2008 to 2013 in assessment of nursing institutions which revealed the lack of balance between theory and practice including absence of clinical courses and related clinical competencies to link theory with practice [94]. Courses should be sequenced in a way that allow nursing students to gain knowledge and critical thinking skills that can be applied to nursing practice. Majority study participants (50 %) agreed that there is no perfect match between theoretical courses and clinical courses in the training program for the pre-service training of competent nurses. Courses that are introduced early in the programme should be sequenced in way that forms a solid base and are applied in future learning experience. Most population of study participants (50.5%) view that there are some courses in the course content that were to be taught before other courses. Studies conducted by WHO and other partners in 2008 to 2013 revealed that there are no clear linkages between content and programme objectives/ learning outcomes in most educational institutions [95]. Nurses should have autonomy so that they can advocate for appropriate sequencing of course in the training program. Most other stakeholders viewed that nurses cannot influence innovations in the training program such as course content sequencing since absence of nurse autonomy so, nurse organization only do registration after training by the various ministries. Nurse leaders and head of nursing associations should be involved in policy making so that they can be involved in designing the training program. Some stakeholders 50% pointed to the fact that nurse leaders are not involved in policy making. Since nurse leaders' involvement in applying innovative educational approaches such as sequencing, might be a kind of guarantee for training pre-service competent nurse.

5.2. Conclusion

According to nursing students' views and experiences in using the nursing institution training program, nursing students recognised the existence of shortcoming in the training program for the fact that some courses that ought to be in the training program were left out. There was no perfect match between theoretical courses and practical courses in using the training program of their institutions. The time lapse between theory and practice in clinical site was inequitable in their school training program as the students disagreed to the short period of theory. There is a theory practice gap from the view point of students. According to the nurse educators' views, the institution training program has non-applicability of some topics, educational content showing weaknesses with theoretical education. The interval between the taught content and apprenticeship is long as they finish theory before practice showing defects of educational planning and challenges in clinical education. There is failure of application of theory in practice in time causing challenges in clinical education and the problem of theory practice gap. From the views of nurse educators, the various training program of the institutions in the north west region of Cameroon has inadequate sequencing of courses, course contents to match planned learning experiences. According to other stake holders' views, the entry profile to nursing education is not respected and consequently to design a course content that meet the draining needs of the students is complicated since the students are having diverse knowledge base. Also, since nurse leaders are not involved in the designing of the training program, it is difficult to integrate theory and practice. From the various findings of appropriate course sequencing in the various institution of inadequate course sequence, limited practical sessions before internship, and inadequate timing, measures are adopted to improve pre-service nurse training in using the uptake measures highlighted above from triangulations. Strategies from various views of the stakeholders and triangulation of findings are used to develop a model for the training of pre-service nurses in training institutions in the North West Region of Cameroon.

5.3. Recommendations

It is therefore recommended that:

- The training program of the various institutions should be revised by applying strategies such as course content sequencing to fill the gap between the theoretical and practical aspects.
- The training program should also be revised such that all course necessary for the training of pre-service nurse are included.
- The time lapse between the learned topics and apprenticeship should be shortened, giving students enough time to integrate the theoretical topics into their practical skills.
- There should be adequate educational planning so that students learn the basic nursing knowledge to be able to solve the problems encountered in clinical situations.
- Nurse educators should ensure that the course content of the training program is well sequenced to match planned learning experiences
- The courses should be sequenced in such a way that there is a perfect match between theory and practical courses.

- The time between theoretical courses and practical be shortened such that each theoretical course is immediately followed by a practical course.
- The practical demonstration in clinical laboratories and clinical sites should be well spelt out in the training program of the various training institutions.
- They should be nurse leader's involvement in designing the training program as they better understand nurse training.
- The entry profile for the various options should be revised so as to ease designing and implementing the course content.
- Uptake measures from pertinent results obtained from triangulation should be used in the training institution to guide training.

Limitations

Training documents were not used for review of the findings hence training document analysis of the various institutions is required for further research into this topic to contrast the findings. Clinical preceptors, and experts in nursing institutions were not included in the study. Therefore, further research would be recommended that include clinical preceptors, stakeholders and experts in order to contrast opinions with these results. The main mentoring university was not included in the study from random sampling, hence purposive inclusion is required for future study to review the standards of this study.

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