



## Review

# Clinical nurse specialist, a new age healthcare, implementation challenges in Nigeria

\*<sup>1</sup>Salihu Dauda, <sup>2</sup>Yahaya Hadiza, <sup>3</sup>Lola Nelson

<sup>1</sup>Department of Nursing Services Yobe State Hospitals Management Board, Damaturu

<sup>2</sup>State School of Nursing Maiduguri

<sup>3</sup>Department of Nursing Science University of Maiduguri

\*Corresponding author's email: [barebaris@gmail.com](mailto:barebaris@gmail.com)

## Abstract

Clinical nurse specialist (CNS) is an advanced practice whose care focuses on a specific patient population. They specialize in certain type of disease such as diabetes; cardiovascular disease e.t.c. can work in many different medical environments such as operating room, emergency room or critical care and focus on a variety of procedures such as surgical or clinical. CNS daily routine includes: clinical practice, teaching, research, consulting and management. They faces many challenges in practice such as implementing scientific findings to ambiguity of roles, reimbursement and billing problems as well as barriers to title protection. Clinical nurse specialist starts from North America within the acute care setting but subsequently expanded to other areas. In Nigeria clinical nurse specialist practice is yet to be adopted, no single University is offering the programme that lead to becoming clinical nurse specialist as at the moment in the country. The challenges of implementing CNS in the country include, lack of policies that will back the programmed, monopoly of the health system by Doctors who are at the helm of affairs in the system and decide what goes to who and when. The CNS will augment Doctors especially in rural communities where there are no Doctors and helps reduce cost and patient waiting time in the hospital if implemented in the country.

**Key words:** Clinical, Nurse, Specialist, Implementation, Challenges, Nigeria.

## INTRODUCTION

Many countries have grown beyond the rivalry between Doctors and Nurses and are enjoying the benefits of advanced nurse practitioners and Nigeria should not be left out. It was a model of health care that was developed due to shortage of physicians in the United State in 1980's and now gaining recognition in many developed countries and with some degree of operation in developing countries (Chika et al, 2014 Citing Price, Patterson and Hegney, 2006) . Globally, more advances in health, science, and technology have been made in the last 50 years than in the 500 years before the 20th Century (WHO, 3003) Health infrastructure has been expanded and education, incomes, and opportunities have improved. Public health interventions and socioeconomic development have reduced mortality and raised life expectancy in many countries.

Unfortunately, these gains have by no means been universal due to some challenges and Nigeria is not left out.

Clinical Nurse Specialist (CNS) as defined by the Advanced Practice Registered Nurse (2008) is an advanced practice registered nurse with graduate preparation (earned masters or doctorate) from a programme that prepares Clinical Nurse Specialist. He/She was seen as an advanced care nurse whose care focuses on a specific patient population. He/she a clinical nurse specialist can specialize in certain types of diseases such as cardiovascular diseases, diabetes etc, and can work in many different work environments such as operating room, emergency room or critical care unit and focus on a variety of procedures such as surgical or clinical.

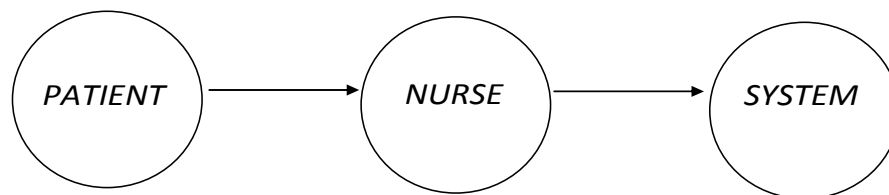


Diagram showing the spheres of influence of clinical nurse specialist

A Clinical Nurse Specialist can be a unit manager, which means he/she can be in charge of their nursing unit or can be an educator and teach courses and train new nurses. They can specialize in a particular field of nursing or can be a clinical research nurse. Clinical nurse specialists are advanced practice nurses with expert knowledge and skills in a specific area of practice. The role of CNS in the field of evidenced base practice has largely been ignored in spite of the fact that it is pivotal in the facilitation of research in to practice in the clinical setting. Clinical nurse specialist influence patient outcomes through implementation, integration, and translation of evidence-based practice in to daily operational activities. The published literature in terms of how clinical nurse specialists access and transfer research knowledge in making clinical decisions are few.

### Spheres of influence of a clinical nurse specialist

According to APRN consensus (2008) model for regulation, the clinical nurse specialist has a unique role to integrate care across the continuum, and the three sphere of influence are:

- Patient
- Nurse
- System (health system)

The three spheres are overlapping and interrelated but each sphere poses a distinctive focus (NACNS, 2004). In each of the sphere of influence the primary goal of clinical nurse specialist is continuous improvement of patient outcome through nursing care.

### Key elements of clinical nurse specialist practice

The key elements are to create environment through mentoring and system change that empower nurses to develop caring, evidence based practice to alleviate patient distress and facilitate ethical decision making and respond to diversity (NACNS, 2004). The clinical nurse specialist is responsible and accountable for diagnosis and treatment of health and illness state, and prevention of illness and risk behaviors among individuals, families, groups and communities (Newhouse et al, 2011). Clinical nurse specialists are clinical experts in specialized area of nursing practice and in the delivery of evidenced based nursing interventions.

Advanced Practice Registered Nurse (APRN, 2008) state that a recent systematic review concluded that utilizing a nurse specialist in a hospital setting reduces length of stay and cost of care while improving patient outcomes. Clinical nurse specialist work with other nurses to advance their nursing practices, improve outcomes and provide changes to improve programmes of care. Clinical nurse specialist works in specialties that are defined by one of the following according to National Association of Clinical Nurse Specialist (NACNS, 2004).

- Population e.g. Pediatrics, Geriatric etc.
- Settings e.g. critical care, emergency department, long term care etc.
- Disease or medical subspecialty e.g. Oncology, diabetes etc.
- Type of care e.g. psychiatric, rehabilitation.
- Type of problem e.g. pain, wound etc.

### Core competencies needed

Within the three spheres of influence identified by the Advanced Practice Registered Nurse (2008) consensus, the seven core competencies needed by a clinical nurse specialist as stated by Sparacino (2005) includes:

- Direct clinical practice which includes; expertise in advanced assessment, implementing nursing care and evaluating outcomes.
- Expert coaching and guidance, which encompasses modeling clinical expertise while helping nurses, integrate new evidence into practice. It also means providing education or teaching skills to patient and family.
- Collaboration: this focused on multidisciplinary team building.
- Consultation: this involves reviewing alternative approaches and implementing planned change.
- Research: this involves interpreting and using research, evaluating practice and collaborating in research.
- Clinical and professional leadership involves responsibility for innovation and change in the patient care system.
- Ethical decision making: involves influence in negotiating moral dilemmas allocating resources, directing patient care and access to care.

Although the core competencies have been described in literature, they are not validated through a review process that is objective and decisive (Sparacino, 2005). They are the opinion of some within the profession. A set of core competencies has now been described and validated through APRN Consensus (2008) that clearly defines the spheres of influence, the synergy model and the competencies. These core competencies are now expected to be used in all nursing educational programmes and will be revised in the coming years in order to be maintained as current and reflective of practice.

### Challenges faced by clinical nurse specialist

These includes that of implementing educational standards consistent with National Association of Clinical Nurse Specialist standards for Clinical Nurse Specialist academic programs and developing a mechanism to recognize programs that meets these standards or incorporate these standards in to accreditation processes. The advanced practice nurse was seen as a cost-effective alternative healthcare provider and was developed to improve access to preventive primary care, especially for the underserved, remote rural areas. This, however, led to advanced practice nurses being stigmatized as being replacement of physicians .When the shortage of doctors was reversed there was a backlash against advanced practice.

Mundinger (1995) suggests that in primary care doctors and nurse practitioners share common bases of knowledge, and doctors obviously have a greater depth of knowledge around disease detection, nurses also bring different additional skills. These include a holistic health assessment, which incorporates environmental and family factors, health promotion/education, disease prevention, counseling and the knowledge needed to craft a care regimen using community and family resources. Despite these, advanced practice Nurses faced the following challenges:

- Implementing scientific findings: technology enables medical researchers to generate valuable findings for those working in health care. A clinical nurse specialist may find it difficult however, to implement this information in to clinical practice and at the bedside of her patient low staff levels, which place more demands on a clinical nurse specialist, also hamper changes as doe's lack of preparation on how to implement new scientific findings.
- Ambiguity of roles: clinical nurse specialist falls under the wide category of advanced practice nurses, along with nursing practitioners, certified nurse midwives and certified registered nurse anesthetist. As an advanced practice nurse, the role of clinical nurse specialist overlaps with the role of other practitioners in education, consultation, research and administrative responsibilities.

- Reimbursement and billing problems: According to balanced and budget act (1997) a clinical nurse specialist should be reimbursed through medicare programme when undertaking a physician's role. Most states in the U.S have a coding and billing system to ensure that clinical nurse specialist receives his/her reimbursement, but have been denied their reimbursement even after performing physician's services.
- Barriers to title protection: Title protection regulates the practice of nurses so that only fully qualified nurses can practice. Not all states in united state recognize the clinical nurse specialists as a protected title (Gordon et al, 2012), which then face challenges of not being recognized as advanced nurses.
- Unnecessary overregulation by credentialing agencies is an immediate concern. We are not against any regulation that can help improve standard of practice but what level of regulation is necessary e.g. seeking another license for Clinical Nurse Specialist practice is an unnecessary barrier to practice. So also taken examination for a Clinical Nurse Specialist to be given a right to prescribe drugs when no such exams is obtainable in other specialties like orthopedic etc also hinders professional growth. For these, we can say they are denied authorization to practice, and public is denied access to services.

### Roles of a clinical nurse specialist

The role of clinical nurse specialist (CNS) is quite diverse and varies according to area of specialization but in general the roles of includes: clinical practice, management and research, consulting and teaching (nurse.com).

The Registered Nurse license authorizes practitioners independently or autonomously to diagnose (nursing diagnoses) and treats (nursing therapeutics/treatments). In addition to this autonomous nursing scope of practice, practice acts authorize RNs to implement delegated medical therapeutics via prescriptive delegation or protocol. Since 1970s most CNSs have practiced at an advanced level within 3 scopes of practice. Some Clinical Nurse Specialists have extracted their practice outside the domains authorized by the RN license e.g. obtaining prescriptive authority.

A clinical nurse specialist performed the conventional nursing roles. He/she combines conventional nursing duties with the areas of expertise. In addition to providing direct patient care in identification, prevention and resolution of illness. A clinical nurse specialist diagnose and treat disease, injuries and disabilities in her field of specialty, she must be able to provide care to individuals, families and group with complex medical needs in her specific area of clinical exercise.

Clinical nurse specialists are key players in determining the direction and outcome of managed care. They serve

as expert consultant to nursing staff and take an active role in developing better health care system. The clinical nurse specialist are trained to take on the role of case managers, they use their expertise to coordinate service and resource for health care practices. Research demonstrated the effectiveness of the clinical nurse specialist role in such areas as reduced hospital costs, fewer emergency room visits, better pain management practices and fewer medical complications in hospitalized patients.

The educational role is an important component of a clinical nurse specialists (CNSs) practice. A clinical nurse specialist typically contributes to the education of several different population including patients, the community, nursing staff and non nursing personnel. In addition clinical nurse specialist also participates in education to train new nurses (Gordon et al, 2012). The education roles of clinical nurse specialist provide the opportunity to positively affect one-on-one patient care and influence improvement in health care system.

### **Licensure and certification for clinical nurse specialist**

In United State certification for some clinical nurse specialists, are available but not all of them. The certifying boards vary based on the specialty in which clinical nurse specialist is seeking certification. Nigerian situation, no literature suggestive of training, accreditation and licensing of clinical nurse specialist in Nigeria. Common comments of experts in Nigeria show that there are no training institutions and licensing of clinical nurse specialist in the country as at the moment.

### **Current situation of clinical nurse specialization in Nigeria**

Nigeria is yet to incorporate clinical nurse specialist in to practice (i.e. general practice) this is possibly so because most of our specialization are at post basic levels, the available post graduate degrees offered at the masters/doctoral level in nursing include the traditional research-focused masters/doctor of philosophy (PhD), no single university is offering Doctor of nursing science (DNS) that leads to becoming clinical nurse specialist as at the moment in the country. Not much has been done in the area of advanced nurse practitioner/nurse practitioner research or concept issues in Nigeria.

### **Benefits of becoming a clinical nurse specialist**

There are many benefits in becoming a clinical nurse specialist ranging from that of job security, medical insurance with good medical coverage's both on vacation

and sick days. Remuneration is another benefit of becoming a clinical nurse specialist this is so because they gets appropriate compensation and benefit package. E.g. as of 2010 clinical nurse specialist earn an average of \$ 87,000 dollars per annum making it the third highest nursing specialty in the United State (Bureau of labour statistics, 2010).

Retirement benefits are also another factor to be considered however, postgraduate development and advancement in nursing knowledge are also inclusive. Clinical nurse specialist may also expect to receive flexible work schedule depending on the environment they work within. In terms of prestige and honor clinical nurse specialist are equal to physicians.

Autonomy in practice, because the new model of nursing care gave a nurse opportunity to treat, refer, order diagnostics, prescribe medications and deliver course of treatment which has previously been the domain of medical professionals. Alongside this role development there has been a growth in role description and Job titles.

### **Drawback to clinical nurse specialist practice**

It takes extra time to get into this field. Example you are required to be registered nurse, obtained a degree in nursing then masters or PhD before practicing as a clinical nurse specialist (Bonsfield, 1997). Nurse.com added that issues of staffing, excessive paper work, conflict (e.g. with patient, families, other healthcare providers), and stress are also drawback to clinical nurse specialist.

### **Steps in becoming a clinical nurse specialist**

- Earn a bachelor degree in nursing with a minimum of 3.0 CGPA based on American educational standard and 3.5 CGPA above in Nigerian educational system.
- Obtain a state licensure or its equivalent as a registered nurse
- Gain experience in the interested field of specialization as an RN for at least two years
- Earn a clinical nurse specialist masters degree from an accredited program which usually takes 2-3 years depending on the specialty.
- Apply for certification (not all specialties have certification credentials available).
- Obtained advanced nursing practice license from state nursing board or its equivalent. Clinical nurse specialist graduate degree program (NACNS, 2002).

### **Factors influencing clinical nurse specialization in Nigeria**

Health policies and the monopoly of the system by

Doctors in Nigeria make it unfavorable for nursing advancement, due to the submissive nature of nursing which is nonresponsive to politics and power game within the health care system. Nursing as a profession has not been a major determinant of health policy in Nigeria. Nigerian doctors always want to determine the scope of nursing practice and education and by implication they can determine the limit of nursing knowledge. Doctors head public health care institutions which gave them the opportunity to influence the training of nurses (Sweet et al, 1995) and medical training programs set up a hierarchical model with nurse in a relatively subservient role. Apart from the monopoly, professional rivalry between nurses and doctor contribute a lot, doctor's fear that nurses will take over their jobs or replaced them. Today in most facilities in Nigeria Doctors hijacked most Nursing/Midwives procedures e.g. IV Drug administration, palpation, conducting deliveries e.t.c Anonymous (2004) further stated that Nurse's leaders are in general agreement that nursing's continuous evolution as a truly autonomous profession is inextricably bound to its ability to influence policy development and to evidence positive public image of nursing as an essential societal service. The concept of power, its distribution and use are concerns of many groups in health profession. As stated by (Anonymous, 2004) professional power has dual aspects. It may be sought and exerted at a local or parochial level, that is internal, or in a national or cosmopolitan setting i.e. Externally, but nursing as a profession has not always enjoyed access to the external broader societal dimension of power and, consequently it was forced to focus most of its efforts in a narrower fashion.

Public policy has significant impact on the practice of nursing profession, what nurse legally can and not do and autonomy of practice not subjected to supervision and authorization of another discipline (See IAP suite with number: IAP/1/43/79 of 1981). Nigerian nurse's has stood on the periphery of both power and politics for so long as a result of its inability to use its own force in the formulation of health policy. Junaid (2010) stated that what are responsible for nursing powerlessness in Nigeria are the absence of nursing research agenda and the scarcity of nursing researchers in health care organizations and that hinders the establishment of clinical nurse specialist. Non involvement of nurses and nursing leaders in policy make positions affects our professional growth. This is so because most nurses are women and therefore the positions of nurses in Nigeria and the value given to them are aligned with their positions in society. This poor representation and participation of nurses in decision making in health matters will not move nursing forward and most of the government policies do not focused on meeting the needs of profession because nurses do not fully participate in policy making, nevertheless, nurses occupy a central portion in the health care delivery system and if

politics is a game of number nurses would surely be the winner (Adejumo and Adejumo, 2009).

Extraprofessional squabbles among nurses in Nigeria contribute to nursing problems, the different associations in nursing plays a major role in setting us backward. The internal problems within nurses themselves, because the professional nursing power is fragmented by subgroups and dimensions. Adejumo and Adejumo (2009) further stated that rivalry among diploma educated and university educated nurses and proliferation of nursing associations and competition among them have diminished nursing potentials. And that makes them weak and not capable for fighting for what is their right. In activeness of nurses union per say National Association of Nigerian Nurses and Midwives also serve as influencing factor to clinical nurse specialization in Nigeria. Nigerian medical association threatened government on so many issues such as: minister of health must be a medical doctor, issues of national health bill, surgeon general of the federation etc. Though no documented literature is evidence but history has shown that University of Ibadan has started "Nurse consultant programme" but Nigerian medical association kick against it and that was subsequently stopped and nursing union were more reluctant instead of taking a radical approach toward actualizing this dream of nurses in Nigeria.

Another problem facing the development of clinical nurse specialization in Nigeria is lack of advocacy for clinical nurse demand clinicians for government to acknowledge the need for clinical nurse specialist.

Resource shortage/facilities problems are also contributive factors; this is so because clinical nurse specialization training requires sophisticated training in advanced manner which requires a lot of finance, training and other facilities. Training clinical nurse specialist requires experts in that particular field of specialization, lack of personnel help in hindering us from starting clinical nurse specialist practice in Nigeria.

### **The relevance and need of advanced nurse practitioners to Nigerian health system**

Chika, et al (2014) on their paper "advanced practice nursing in developing countries: perception of Nurses in selected health care facilities in south east Nigeria". Have the following to offer as relevance to Nigeria: Advance nurse practitioners are important in Nigeria because it will help to solve people's health problems. More nurses will be available to help in the system especially in the rural areas where Doctors are not enough. Advance nursing practice will augment services in the rural areas because doctors are not there in the communities. It is worthy of note that health gaps within and between countries have widened, perhaps due to inequality in the absorption of new technology as well as unequal distribution of new

and re-emerging health problems (Von Schirmding, 2002). Disparity has increased, with a third of the global population wallowing in absolute poverty (Taylor and Taylor, 2002). Each year, we are losing more than 11 million children to preventable diseases as a result of inequalities in health and development and problems are worst where resources are least available; those who need more care have the least access (Gwatkin et al, 1999) and Africa carries the largest burden of all these simply because we are yet to adopt advanced practice nursing. With advanced Nurse practitioners/nurse practitioners, both time and cost is saved for the patients. In hospitals, the number of patient's is quite high which often leads to seeing them in a rush, but with advanced nurse practitioners better attention will be paid to the patients and Doctors workloads will be reduced. Advance nurse practitioners will reduced waiting time in hospitals because patients tends to come so early and leave late causing stress on them, and some end up not been seen by the Doctor (Chika et al, 2014).

### The way forward

So many factors are identified as militating against clinical nurse specialist practice in Nigeria but the only way to address them is for nurses to:

- Have diverse knowledge on health politics and have full participation. So also nurses association in Nigeria should create a political division as obtainable in American nurses association. This will help in addressing our non involvement in health policy making.
- There should be proper planning and budgeting for nurses and nursing. A system should be design that will enhance collaborative planning and implement actions and policies to address the changes occurring in nursing labour markets.
- All nursing association should be dissolved and all nurses should remain under one platform i.e. NANNM, this will make them stronger and powerful and all the Intraprofessional conflicts will be addressed.
- There should be advocacy for clinical nurse demand clinicians for government since it is the only way to address manpower shortage most especially that of nurses in primary care.
- Nurses must show their readiness and willingness to be clinical nurse specialist in Nigeria.
- Nurses union must be ready at all time to fight for nurses right at all situations, not only on wage issues but professional development as well e.g. nursing internship.
- there is need for support among Nurses/Nursing community for the introduction of measures such as advanced practice register in nursing and midwifery council of Nigeria.
- there should be capacity building training for nurses on leadership skills and change management skills are required to support the development of new ways of working and creating new services.

### Implication for nursing

Clinical nurse specialists with advanced knowledge of the impact of disease on health and wellness are in unique position to utilize research based data in the design of various programs for diverse population in practice. To transform nursing education by deliberately changing focus of nursing professional identity, provide expert knowledge and skills for nurses and the need for further development of clinical nurse specialist's ability to retrieve, use and transfer knowledge to findings in nursing practice and ultimately improve patient care.

### RECOMMENDATIONS

- Government should consider the need for establishing institutions for clinical nurse specialization in Nigeria
- Nigerian health care policy should be reviewed to allow for equity, transparency, accountability and social justice to all health care professionals.
- Job description for nurses in Nigeria should be reviewed to ensure that they reflect that of clinical nurse specialist practice, roles and scope, this can be done by reviewing the nursing and midwifery act.
- Government should provide strategic oversight to ensure the necessary operational infrastructures for clinical nurse specialist practices are in place to support new ways of working.
- Nursing and midwifery council in Nigeria should identify a board level champions that will drive role and service redesign, ensure consistent methodology for service redesign and ensure that services are redesign with patient focused approach.
- The core competencies needed for clinical nurse specialist practice should be used in all nursing educational programs in Nigeria.
- There was urgent need for certification, accreditation and licensureship of clinical nurse specialist in Nigeria.
- All school of nursing should be converted to colleges of nursing and be affiliated to universities offering degrees in nursing science and be allowed to run a degree program instead of diploma.
- All students undergoing BNSc program should be encouraged to pick a specialized area of interest and continue with it as clinical nurse specialist.
- Nurses and nursing students need to stay abreast of current issues and be active with local nursing leaders to communicate nursing's position(s) on health care reforms and alternative health care delivery models like CNS.

### REFERENCES

- Adejumo PO, Adejumo AO (2009). Current trends and issues in nursing in Nigeria. Ibadan University Press: 247-255.

- Advanced Practice Registered Nurse (2008). Consensus at glance baseline for APRN licensure, accreditation and certification/education. Group report national council of state board nursing.
- Anonymous (2004). Nursing and the political arena. New York state university press, Albany: 2
- Bonsfield C (1997). A pharmacological investigation in to the role of clinical nurse specialist. *J. of advanced nursing*, 25: 245-256.
- Chika G, Anthonia I, Cordelia C (2014). Advanced practice nursing challenges in developing countries: perception of nurses in selected health care facilities in south east Nigeria. Retrieved from [www.Commonwealthnurses.org/coference2014/.../chikaUgochukwu.pdf](http://www.Commonwealthnurses.org/coference2014/.../chikaUgochukwu.pdf) on 15/11/2014.
- Gordon JM, Lorilla JD, Lehman CA (2012). The role of the clinical nurse specialist in the future healthcare in the United States. U.S army research paper 196. Retrieved from <http://digitalcommons.unl.edu/usarmyresearch/196> on 01/06/2015
- Gwatkin D, Guillot M, Henveline P (1999). The Burden of Disease among the Global Poor. *Lancet*. Vol. 354.
- Junaid MK (2010). The challenges of sustainable development of nursing in Nigeria; Keynote address delivered at the "1<sup>st</sup> National Nurse Scientist conference" held at the University of Nigeria, Enugu Campus. Enugu State from 11<sup>th</sup> to 15<sup>th</sup> of Oct.
- Mundinger M (1995). Advanced practice nursing is the answer.....what is the question? *N&HC: perspective on community*. 16(5):245-9 (sept/oct).
- NACNS Journal (2002). clinical nurse specialist. A journal for advanced nursing practice retrieved 16 November 2012 from [www.Cns.journalcom](http://www.Cns.journalcom).
- National Association of Clinical Nurse Specialist (2004). Statement on clinical nurse specialist practice and education. Harrisburg, Pa national association of clinical nurse specialist.
- New house et al (2011). Advanced practice nurse outcomes: 1990-2008. "A systematic review" *nursing economics* 29(5) retrieved from <http://WWW.nursing economics .net/ce/ 2013/article3001021.pdf>.
- Nurse.com-Nursing news retrieved from <https://www.nurse.com/students/careersInNursing/Nursingpositions/CNS.htm>
- Sparacino PS (2005). The Clinical Nurse Specialist. *Advanced practice nursing and integrated approach*. 3<sup>rd</sup> edition: 415-446.
- Sweet SJ, Norman IJ (1995). The nurse- Doctor relationship. A selective literature review. *J. of advanced nursing*: 165-179.
- Taylor and Taylor C (2002). *Just and Lasting Change: When the Communities own their Futures*. The John Hopkins University Press, Baltimore, USA.
- U.S Balanced and budget act of 1997.
- U.S Bureau of labour statistics (2010). *statistical abstract of the U.S* Washington D.C
- Von Schirnding, Y (2002). *Health in Sustainable Development Planning; the Role of indicators*, WHO, Geneva, Switzerland.
- World Health Organization (2003). *The global health workforce crisis*, World Health Report, WHO, Geneva, Switzerland.