

Epidemic of Non-communicable Diseases: Role of Nurse Practitioners

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The role of Nurse Practitioner (NP) role is rapidly emerging worldwide. The NP's role emphasises health promotion, health maintenance, prevention and detection of alteration in health through supportive interventions, counseling and teaching of families, staff, and other providers. India is experiencing a rapid health transition which positions non-communicable diseases (NCDs) as a major health challenge of growing magnitude in the 21st century. The rising burden of non-communicable diseases is placing an increased demand on health care services and scarce human resource. India's health delivery system has a severe shortage of human resource for health (HRH) as the health workforce density is less than the WHO norm of 2.5 workers/1000 population. Innovative strategies are therefore, needed to optimise existing services. As nurses are the key health care providers, utilisation of nurses as nurse practitioners for primary and secondary prevention of NCDs can contribute towards improving the outcomes in individuals, families and communities.

Prevalence of NCDs

Non-communicable diseases are the leading cause of death globally. Of the 57 million global deaths in 2008, 36 million or 63 percent were due to NCDs, comprising mainly cardiovascular diseases, cancers, respiratory diseases and diabetes (WHO, 2010). India too is experiencing rapid health transition with a rising burden of non-communicable diseases. NCDs account for 53 percent of the total deaths in India. It is predicted that by 2030 NCDs will account for almost three quarters of all deaths in India (Patel et al, 2011). Population growth and increased longevity are leading to a rapid increase in the total number of middle-aged and older adults, with a corresponding increase in the number of deaths caused by NCDs.

The trend towards progressive reversal of social gradient has also been observed. The relationship of socioeconomic status is changing as the epidemic evolves (Thakur et al, 2011). A study to assess the prevalence of selected risk factors for cardiovascu-

lar diseases among different social groups living in urban and rural areas of northern India showed that hypertension in urban (39%; 95% CI 29.5% – 49.2%), slum (35%; 95% CI 27.2% – 42.9%) and rural (33%; 95% CI 25.4% – 40.8%) communities was statistically similar ($p>0.05$) after controlling for age, gender and education. However the social gradient has been observed for tobacco use as the risk of tobacco use was significantly lower among literates (OR 0.3; 95% CI 0.1 – 0.8).

The rising burden of NCDs to the epidemic proportions substantiates the need to take urgent measures to control the same. The growing burden is also contributing to increased health care costs in terms of resources required especially the human resource. India's health care delivery system faces severe shortage of human resource for health (HRH). Estimates of 2005 (based on 2001 census) suggest that India had almost 2.2 million health workers including allopathic doctors, nurses & midwives, pharmacists, practitioners of AYUSH and others, which means roughly 20 health workers per 10,000 population. However when these self-reported estimates were adjusted for educational qualification according to the estimates of National Sample Survey Organisation (NSSO), the health workforce density reduced to little over 8 health workers per 10,000 population (Rao et al, 2011). Considering this HRH deficit, innovative strategies are needed to optimise existing services for managing NCDs. Task shifting is one among the various solutions available. In the present review, referred papers were identified by search through pubmed databases from 1998 to 2013.

Human Resource for Health in India

The global human resource deficit in healthcare is pervasive (Terry et al, 2012). The major contributing factor of health worker crisis is brain drain i.e. migration of doctors and nurses from developing countries to the developed world. Underproduction of health workers is another important factor. Since independence, concerted efforts have been made to address the need for human resources for health in India. However, shortage exists in all categories of human resources at different levels.

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There is also a considerable variation of health workforce distribution in different states in India. These range from as low as 10 per 10,000 population in Bihar to as high as 42 in Goa. However most states tend to cluster in range of 10-30 per 10,000. The rural urban distribution of health workforce is also skewed (Rao et al, 2009). In India 69 percent of the population live in rural areas whereas majority of the health infrastructure and workforce are concentrated in urban areas. According to NSSO estimates the density of allopathic physician in urban and rural areas was 11.3 and 1.9 respectively per 10,000 population (Rao et al, 2011). This large urban bias need to be addressed as availability of health manpower is one of the important prerequisite for the efficient functioning of rural health infrastructure (Rao et al, 2009).

Some of the possible solutions for meeting the challenges of human resource include increasing production capacities to meet human resource shortage, strengthening the public health system, mainstreaming doctors of AYUSH, employing task-shifting and strengthening nursing and paramedical cadres (Terry, 2012).

While a substantial scale-up of the health workforce is needed across several cadres, the rapid expansion of HRH on a massive scale will take multiple Five-Year Plans. Planning must include some provision of interim solutions to address HRH gaps that could supplement and/or replace long-term HRH expansion. A number of countries have explored and successfully relied on the use of alternate and allied human resources to make up for shortage of formally trained medical practitioners (Jithendra & Johar, 2012).

Many countries have health-care providers who are not trained as physicians but who take on many of the diagnostic and clinical functions of medical doctors. In a survey of 47 countries in sub-Saharan Africa it was found that non-physician clinicians (NPCs) were working in 25 countries. All 25 of these countries with NPCs ranked among the 36 African countries that are recognised by WHO to have a critical shortage of health workers. Nine countries had the same or greater numbers of NPCs as physicians, suggesting that they relied heavily on NPCs' contribution to health systems. Many NPCs were recruited from rural and poor areas, and worked in these same regions (Mullan & Frehywot, 2007).

Various steps are taken by centre and state governments to address the health manpower shortage. Under National Rural Health Mission (NRHM)

introduction of ASHA and mainstreaming AYUSH are being undertaken. States of Chhattisgarh and Assam have deployed non-physician clinicians to address the rural health worker deficit (Rao et al, 2012). Recently the Medical Council of India (MCI) has introduced a three-and-a half-year medical course of BSc in Community Health. However little is explored about enhancing the productivity of existing Human Resource in Health for example training nurses as nurse practitioners so that they can work as frontline workers in different health care settings.

Nurse Practitioners' role in NCDs

Considering the high burden of NCDs combined with continued shortage of HRH, task shifting is a priority. Task shifting refers to transferring the clinical tasks from physicians to trained non-physician health workers e.g. nurses. Nurses and midwives are the key health care providers and primary caregivers at the community level. In the Primary Health Care setting, they are the first contact for the community and individual patients. Several factors have led to this expansion in the role of nurses, including issues of cost, the need to increase provision of care to improve access, the availability of doctors, and the skills and expertise of nurses (Harrocks et al, 2002).

Nurses can deliver many of the basic clinical and public health services, particularly at the community level, at a lower cost than trained physicians. International evidence suggests that adequately trained and supported nurse practitioners may successfully provide healthcare, in particular to marginalised communities.

According to American College of Nurse Practitioners, a nurse practitioner is a registered nurse with advanced academic and clinical experience, which enables him or her to diagnose and manage most common and many chronic illnesses, either independently or as part of a health care team. A nurse practitioner provides some care previously offered only by physicians and in most states has the ability to prescribe medications. Working in collaboration with a physician, a nurse practitioner provides high-quality, cost-effective and individualised care for the lifespan of patient's special needs.

Internationally the trend has favoured the training of nurse practitioners. Nurses are already an established and sometimes largest category of the workforce in the country so the creation of new category of health worker is not required. Moreover

nurses are flexible multi-skilled workforce that provides a wide range of curative and preventive services. Some of the nurses are already living and working in underserved areas where they have strong family ties and are willing to live and work there.

Nurse practitioners have existed in the western world for many years and the increasing availability of nurse practitioners in primary care has led to high levels of patient satisfaction and high quality care (Horrocks et al, 2002). In US, the NP role was first conceptualised in 1965 with a certificate programme for nurses to provide primary care to children in the community. Later multiple certificate programme were started in an effort to fill gaps in supply of physicians in rural areas (Aleshire et al, 2012). Many other countries have also embraced and developed the models using advanced practice roles providing regulatory and supportive frameworks. Nurse anaesthetists and nurse midwives first appeared in Korea in the 1950s, and NPs appeared in 1980s. Nurses in New Zealand have been practicing in rural and remote sites and are often the sole providers of healthcare at these sites. The NP movement in the United Kingdom was started by the Royal College of Nursing in London.

Studies have shown that nurses can be successfully trained for the assessment and management of NCDs. A study was done on implementation of a nurse-led NCD service based on clinical protocols in a resource-poor area of South Africa. The results revealed that the protocols enabled the nurses to control the clinical condition of 68 percent of patients with hypertension, 82 percent of those with non-insulin-dependent diabetes, and 84 percent of those with asthma. Patient-reported adherence to treatment increased from 79 percent to 87 percent ($p=0.03$) over the period of 2 years. The study concluded that the use of simple protocols and treatment strategies helped nurses to manage the cases of NCDs and helped patients to receive convenient and appropriate treatment at their local primary care facility (Coleman et al, 1998).

A systematic review of randomised controlled trials and prospective observational studies was conducted to determine whether nurse practitioners can provide care at first point of contact equivalent to doctors in a primary care setting. The results revealed that nurse practitioners had longer consultations (OR -3.67, $p<0.00001$), made more investigations (OR-1.22, $p<0.03$) than doctors. However no differences were found in prescriptions, return consultations, or referrals as compared to doctors. The review concluded that the patients were at least as satisfied with care at the point of first contact

with nurse practitioners as they are with that from doctors. Increasing availability of nurse practitioners in primary care is likely to lead to high levels of patient satisfaction and high quality care. In another study, a randomised controlled trial on cardiovascular risk management by practice nurses revealed that the risk decreased significantly after one year of treatment (Tiessen et al, 2012).

In a meta-analysis of secondary cardiovascular disease prevention programme with 63 randomised trials, 45 percent were nurse-led or nurse-managed. The results demonstrated that cardiovascular disease control programme led to reduction in all-cause mortality and acute myocardial infarction (MI) by 17 percent over a median follow-up of 12 months (Clark et al, 2005).

Nurses can be the cost effective health care provider by contributing enhanced quality of care and cost effectiveness in health settings (Patel et al, 2011). NPs and nurse midwives in primary care provide care comparable in quality to physicians while offering superior health education and follow-up with significant cost savings (Jenkins et al, 1994).

In our country, Indian Nursing Council has introduced a post basic diploma in nurse practitioner and midwifery. The government of Gujarat has taken an initiative to start 'The Nurse Practitioner in Midwifery' (NPM) programme for developing midwifery-led maternal and newborn care services. For autonomous practice these NPMs will be given the authority to admit, refer and discharge the mother on their own discretion. They will also have the right to run ante-natal and post-natal clinics, prescribe basic laboratory tests, and medicine (Tiwari et al, 2012). Evidences of other NPs model in the management and control of NCDs are also available in India. For example one community intervention trial carried out to assess the feasibility of an adapted WHO CVD risk management package in a primary care setting revealed a significant decrease in mean SBP (8.8 mmHg) during follow-ups. Significantly higher reports of intention to quit tobacco (60.3% vs 25.5%) and regular intake of anti-hypertensives medication (58.3% vs 34.8%) were observed in the intervention area compared to the control area. The study concluded that ANMs were able to implement the adapted WHO CVD package effectively in selected communities of northern India (Kar et al, 2008). So similar efforts can be made where nurses can be trained in assessment and management of cardiovascular and other NCDs.

Nursing represents one of the largest health workforce in India. According to NSSO estimates

Nurse and midwives density was 2.3 per 10,000 population as compared to the total health worker density of 8 per 10,000 population (Rao et al, 2011). In India educational opportunities for nurses have also increased rapidly. In 2011 there were 935 teaching institutes for Auxiliary Nurse and Midwives training, 2351 offering diploma in General Nursing and Midwifery, 1570 and 500 institutes offering Bachelors degree and post basic BSc degree respectively, and 450 offering Masters in nursing. As per the state nursing councils records, there were 11,28,116 registered nurse and midwives, 5,76,810 registered ANMs and 52,490 registered LHV's in 2011.

Thus the nurse practitioners option for working in the area of NCDs can be explored. While emphasising on primary care, nurse practitioners can focus on health promotion, disease prevention, counselling and patient education for prevention and control of NCDs. In order to keep up the motivation of nurse practitioners and to support them in their practice, there should be a legal coverage for the services they provide. The law should govern nurse practitioners definition, scope, prescriptive authority and requirement of physician collaboration, if any.

Conclusion

Today as NCDs have emerged as a biggest challenge in the 21st century and the treatment of these diseases is resource-intensive, primary and secondary prevention of these diseases is a priority. Nurses and NPs can be the best solution, not simply because of cost saving but proven record of success. Considering the deficit of human resource for health in India especially in rural areas, the utilisation of well-trained nurse practitioners can result in efficiency of health care resources and will also contribute towards providing quality of care.

References

- Global status report on Non communicable diseases 2010. WHO
- World Health Organization. NCD country profiles, 2011
- Patel V, Chatterji S, Chisholm D, Ebrahim S, Gopalakrishna G, Mathers C, et al. Chronic diseases and injuries in India. *Lancet* 2011; 377(4): 13-28
- Thakur JS, Prinja S, Garg CC, Mendis S, Menabde N. Social and economic implications of Non communicable diseases in India. *Journal of Community Medicine* 2011; 36: 13-22
- Kar SS, Thakur JS, Viridi NK, Jain S, Kumar R. Risk factors for cardiovascular diseases: Is the social gradient reversing in northern India? *Natl Med J India* 2010; 23: 206-29
- Rao M, Rao KD, Kumar AKS, Chatterjee M, Sundararaman T. India: Towards Universal Health Coverage 5, Human resources for health in India. *Lancet* 2011; 377: 587-98
- Terry B, Bisanzo M, McNamara M, Dreifuss B, Chamberlain S, Nelson SW et al. Task shifting: Meeting the human resources needs for acute and emergency care in Africa, *African Journal of Emergency Medicine*, 2012
- Nandan D, Nair KS, Datta U. Human resources for public health in India – issues and challenges. *Health and Population- Perspectives and Issues* 2007; 30(4): 230-42
- Rao KD, Bhatnagar A, Berman P: India Health Beat, Volume 1. In India's health workforce: size, composition and distribution. Ed: La Forgia J, Rao KD. New Delhi: World Bank, New Delhi and Public Health Foundation of India; 2009: 3
- Ministry of Health and Family Welfare. Bulletin on Rural health Statistics in India. 2010. New Delhi
- Jithendra A & Johar Z. Allopathic doctors in short supply: Need for trained practitioners of alternative medicine. *Economic Times Bureau*. Aug 9, 2012
- Mullan F, Frehywot S. Non-physician clinicians in 47 sub-Saharan African countries. *Lancet* 2007; 370: 2158-63
- Rao KD, Bhatnagar A, Berman P. So many, yet few: Human resources for health in India. *Human Resources for Health* 2012; 10:19
- Horrocks S, Anderson E, Salisbury C. Systematic review of whether nurse practitioners working in primary care can provide equivalent care to doctors. *BMJ* 2002; 324: 819-23
- What is a nurse practitioner. Available at <http://www.npapr.org/whatis.shtml>. (Accessed on 23rd Nov 2012).
- Aleshire ME, Wheeler K, Prevost SS. Future of advanced registered nursing practice. *Nursing Clinics of North America* 2012; 47(2): 181-89
- Conference Report. 2nd ICN International Nurse Practitioner/ Advanced Practice Nursing Network Conference. *Medscape Nurses* 2002. Accessed from Internet
- Coleman R, Gill IG, Wilkinson D. Noncommunicable disease management in resource-poor settings: a primary care model from rural South Africa. *Bull. World Health Organization* 1998, 76(6): 633-40
- Tiessen AH, Smit AJ, Broer J, Groenier KH, Meer KVD. Randomized controlled trial on cardiovascular risk management by practice nurses supported by self monitoring in primary care. *BMC Family Practice* 2012; 13:90
- Clark AM, Hartling L, Vandermeer B, McAlister FA. Metaanalysis: secondary prevention programs for patients with coronary artery disease. *Ann Intern Med* 2005; 143(9): 659-72
- Kumar TD. Independent nurse practitioner: scope, settings and innovations. *Nursing Journal of India* 2001; 12: 267-68
- Jenkins ML, Marx EMS. Nurse practitioners and community health nurses. *Nursing clinics of North America* 1994; 29(3): 459-70
- Sharma B, Mavalankar D. Health policy processes in Gujarat: A case study of the Policy for Independent Nurse Practitioners in Midwifery WP No. 2012-08-01 August 2012, Indian Institute of Management Ahmedabad
- Kar SS, Thakur JS, Jain S, Kumar R. Cardiovascular disease risk management in a primary health care setting of North India. *Indian Heart J* 2008; 60: 19-25
- Tiwari RR, Sharma K, Zodpey SP. Situational analysis of nursing education and work force in India. *Nursing Outlook* 2012; 30: 1-8