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Non-communicable disease competencies in undergraduate medical (MBBS) curriculum of Patan Academy of Health Sciences, Nepal

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Abstract

In the absence of equitable and well-established health care delivery system, the populations of lower middle income countries are more vulnerable to the impact of the non-communicable diseases (NCDs). However, adequate focus on teaching the NCD related competencies in the curriculum of medical professionals is missing in many of these countries.

The South-East Asia Regional (SEAR) NCD Network took an initiative to evaluate the NCD competencies in the pre-service curriculum of the health care providers. As part of this initiative Patan Academy of Health Sciences (PAHS), School of Medicine (SOM) conducted a competency matching exercise for the NCD related competencies in its undergraduate medical (MBBS) curriculum using the tools and format developed by SEAR NCD Network Partners. It was found that 46 out of 55 listed competencies were either fully or partially covered while 10 of the competencies were not addressed in the PAHS MBBS curriculum. Following this exercise, the working group at PAHS School of Medicine has come up with an action plan, has identified a few NCD related competencies to be certified along with the tools and timing of certification

Competency in NCD management ensures that future physicians have the necessary skills and knowledge to provide appropriate treatment and care for patients with NCDs through early detection and effective patient education which can reduce the burden of NCDs and the costs associated.

Keywords: competency mapping, curriculum, medical, non-communicable disease, undergraduate medical education

Introduction

Non-communicable diseases (NCDs) are responsible for 71% of all deaths globally. Every year millions of people die prematurely across the world, while hundreds of millions more suffer from the complications and consequence of these chronic diseases.^{1,2} In the absence of equitable and well established health care delivery system, the populations of lower middle income countries are more vulnerable to the impact of the NCDs. NCDs claim lives at a younger age in South East Asia Region compared to rest of the world.³ In Nepal, the WHO and World Bank estimates NCDs accounted for 39% of the total country's disease burden, and nearly half of all deaths.⁴ In order to address the increasing burden of NCDs, a wider population based intervention in addition to the individual intervention is needed.⁵ South-East Asia Regional (SEAR) NCD Network took an initiative to evaluate the NCD competencies in the pre-service curriculum of the health care providers. As part of this initiative Patan Academy of Health Sciences (PAHS) participated in this SEAR NCD institutional network. This network has identified 55 competencies under ten headings. Here in this article we are presenting the process and the findings of NCD competency mapping in the PAHS undergraduate medical (MBBS) curriculum, using the competency framework developed by SEAR NCD Network partners, along with some recommendations for the way ahead.

Method

After the institutional level agreement to participate in the SEAR NCD network activity of mapping NCD competencies in the pre-service education, we at Patan Academy of Health Sciences formed a five-member core committee under the Dean School of Medicine with the Vice Chancellor of the Academy as the Senior Advisor to the committee. A few virtual meetings of the SEAR institutional network, one at the beginning and a few in between the process, were carried out. The identification of the

competencies, the framework for competency mapping, format/ template and tools were discussed and agreed by the SEAR NCD network partners.

At PAHS, initially a few meetings of the core committee were held to discuss and define the method of curriculum review. A field visit to rural areas of Makwanpur district (one of the distributive learning site for PAHS undergraduate students) was done by the PAHS officials where discussion on NCD competencies and the Algorithms of NCD management in the WHO PEN were held with the doctors and mid-level health workers, working in Rural Health Centres. This discussion brought some insight into the important components of NCD competencies and the areas to be emphasized in the pre-service medical curriculum. To review the undergraduate medical curriculum (MBBS) we then formed a working committee including faculties from basic sciences, clinical sciences and community health sciences.

The working committee reviewed the MBBS curriculum of PAHS School of Medicine to assess the components of NCDs covered by the curriculum and to assess whether or not the competencies identified by the SEAR NCD network were covered in the curriculum. The identified components and competencies were categorized as per the common template focusing on educational method, time in the course they were taught, assessments tools used and the expected competency levels. The summarized data was validated by a larger group consisting of faculty representatives from various related departments, both clinical and non-clinical, who were involved in teaching and assessment. The large group had a detailed discussion of the gaps in the curriculum against the NCD competency template created by the SEAR NCD Network Partners and discussed on the ways and processes for mitigation of such gaps. Further discussion on the assessment tools to ensure the NCD competencies were carried out on multiple sessions. The outcome of the discussions of the large group was then compiled by the

working group and a report was prepared with recommendations and the work plan (Figure 1, [supplement](#)).

PAHS undergraduate medical (MBBS) curriculum & Teaching-Learning Tools

The MBBS curriculum of Patan Academy of Health Sciences, School of Medicine, is a spiral curriculum with vertical and longitudinal integrations. Problem based Learning (PBL) is the main teaching learning (TL) tool during the Basic Science years and the Basic Sciences are taught as Integrated System based approach. From the first-year students are also exposed to patients and clinical medicine through ICM (Introduction to Clinical Medicine) curriculum where they learn the basic skills of history taking and examination. In the Clinical years, Clinical Presentation (CP) curriculum is the main TL tool and there are a total of 103 CPs, divided among different departments/specialities, through which students learn the approach to the common clinical conditions/presentations. The CP curriculum also includes case based discussions (CBD) with paper cases, and presentations and discussions on management topics. Throughout the MBBS course students are taught in small groups of 10-12 and only the Common lectures are in the large group

Under community based learning and education (CBLE) students are posted to different levels of the community and national health system with the duration ranging from one week in urban slum to a few weeks residential placement at the ward level, Health post and Primary Health centres and a five month long placement at district level hospital and district public health office on the 5th year. These placements not only help orient students to the national health system and familiarize with the community, but also teach them about data analysis & its use in service delivery, NCD delivery service and Health promotion. The virtual class rooms (VCR) conducted when the students are on their district hospital placement (in small groups of 7-9 students at 4 different sites), students present the common cases they have seen and managed at each site with the

main focus on the common diseases and conditions presenting to those hospitals. These sessions are facilitated by the faculty at the school and includes sessions on common presentations of the major NCDs. Longitudinal patient follow up includes home visits of allotted patients (patients with chronic illness, mental or physical disabilities and terminally ill/dying patients), helping students understand the social determinants of health, impact of chronic illness on the patient and the family.

In the PAHS MBBS curriculum, all the diseases and conditions are classified under 4 levels of competencies. Competency level 3 (graduates should be able to diagnose and perform initial management and refer for subsequent management) and Competency Level 4 (graduates should be able to manage independently) are the main focus of teaching learning and assessments.

The terminal competencies for the graduates are defined. Students are certified comprehensively through written and practical examination while all the terminal competencies are not separately certified for individual students. The assessment tools used are multiple choice questions (MCQ), problem based questions (PBQ), mini clinical examinations (MiniCEX), directly observed procedural skills (DOPS), objective structured clinical/practical examination (OSCE/OSPE), learning log with reflective writing, case presentations, log books, project reports and oral exams (VIVA).

NCD competencies in the current PAHS MBBS curriculum

The SEAR NCD network has identified 55 competencies under the following 10 headings:

- (1) Hypertension and Cardiovascular diseases,
- (2) Diabetes Mellitus, (3) COPD & Asthma, (4) Common Cancers, (5) Healthy life style counseling, (6) Self-care & Palliative care, (7) Mental Health, (8) Data Analysis & its use in Service delivery, (9) Organization of NCD delivery services and (10) Health promotion. The competencies covered using all of the

appropriate TL tools (Lectures / small group discussion/ group exercise/ field visit/bed side or skill lab teaching) were considered fully covered and those competencies taught but not all of the appropriate TL tools used were considered partially covered.

The PAHS MBBS curriculum covered 46 out of 55 competencies either fully (15) or partially (31). Ten of the competencies were not covered through any of the TL tools.

The competencies related to the four major NCDs (Hypertension and Cardiovascular diseases, Diabetes Mellitus, COPD & Asthma, Common Cancers) are covered during the basic science and clinical science years through PBL, CP, group exercises, skill stations and VCR sessions. Healthy life style counseling, Mental Health and Health promotion competencies are covered during placement in Departments of General Practice & Emergency Medicine, Psychiatry and Community Health Sciences. Some of the competencies under Data Analysis & its use in Service delivery are covered during CBLE through assigned projects like community diagnosis, public health projects and strategic planning. Only a few of the competencies under self-care & Palliative care and Organization of NCD delivery services are covered in the PAHS MBBS curriculum and they are done during placement at Departments of General Practice and Community Health Sciences and during the CBLE. During their Internship year, all the students receive 2-day long training on Palliative care.

For assessment of the identified 55 NCD competencies, MCQ was used for 29 competencies and PBQ for 26 competencies. Similarly, MiniCEX for 23, OSCE/OSPE for 24 and oral exam (VIVA) are used for 31 competencies. Logbook for 23, Portfolio for 6 and Field report for 6 competencies are used as assessment tools. Out of 55, 13 competencies are at the competency level of 'Knows how', 7 are at the level of 'Shows how' and 23 are at the level of 'Perform'. The tables below (Tables 1a, 1b & 1c, [supplement](#)) show

the competencies listed under Hypertension & CVD, Diabetes Mellitus, Asthma & COPD, Common cancers, Mental Health and Healthy Life style along with the teaching learning tools, assessment tools and the level of competency.

Of the 7 competencies listed under 'self-care and palliative care', (Table 2, [supplement](#)) only one (Manage pain in cancer patients using WHO step-ladder approach of pain management) is addressed in PAHS MBBS curriculum through a Clinical Presentation of Dying patient (CBD and topic presentations) and a two day long Palliative care training given during the Internship year with the competency level at 'Knows How'. For the 2 competencies listed under 'Health promotion', group exercises are conducted during the CBLE and these competencies are at level of 'Knows How'. Similarly, out of 5 competencies listed under 'Data analysis and its use in service delivery and decision making' only 3 are covered through lecture, group exercise during CBLE and DOPA with the competency at performance level (Perform). Based on this, the working group at PAHS SOM has come up with the following action plan and suggestions:

- Faculty orientation and training for NCD competencies
- Developing the TL tools for the NCD competencies not covered in the existing curriculum
- Making a provision to allot a dedicated week in the Senior Clerkship year (Year 4/5) to fill in the gap in the NCD competencies
- Making the course plan for the 'dedicated week' (Module on PEN package -WHO online course; WHO mhGAP Algorithms)
- Identifying the NCD competencies to be certified
- Developing standard checklist for the assessment tools for certification of the identified competencies
- Getting the curricular revision (addressing NCD competencies) approved from the PAHS Academic Council
- Advocating for and working together with the Medical Education Commission, Nepal

to incorporate NCD competencies into the pre-service training curriculum at National level

PAHS SOM working group on NCD competencies has identified the competencies to be certified and has come up with the suggested tools, the timing during the course for certification and the departments responsible. (Table 3, [supplement](#)).

Discussion

It is important that all the medical graduates have the required competencies to improve the care of patients with NCDs and reduce the burden of NCDs in the community and provide quality palliative and end of life care. In view of the rapid demographic and epidemiological transitions in the lower middle income countries with increasing burden of NCDs, there is a need for their future health workforce trained appropriately to tackle the challenge. This can be achieved through modification/revision of the pre-service curriculum of health workforce.⁶ However, It has been observed that the present undergraduate curriculum in many countries do not have adequate focus on teaching the NCD related competencies, both clinical and preventive. It is reported that the undergraduate medical and nursing curriculum in India do not adequately cover prevention and control of NCDs.⁷ While a landscaping exercise of the teaching of NCD risk factors in the MBBS curricula from select medical colleges in India showed inadequate focus on NCD risk factors and healthcare promotion.⁸ Similarly, a lack of conceptual and contextual understanding of the NCD prevention and control program in the undergraduate medical curriculum has been observed in Bangladesh.⁹ A study from the oldest medical school in Nepal has found a low to moderate confidence in managing major NCDs among the MBBS Interns with limited skills of independently diagnosing and screening for NCDs, counseling on healthy lifestyle, self-care and palliative care.¹⁰

The need for a transformation of medical curriculum, with inclusion of lifestyle medicine, for sufficiently preparing health professionals to deliver health-promoting services confidently, has been realized.^{11,12} Defining competencies of graduating doctors will help align the educational program with the health system priorities.¹³ Therefore this requires the schools to move towards competency based curriculum. The conventional teaching learning tools being used might not be appropriate to teach many of these NCD competencies while the assessment tools used cannot ensure the required competencies. We should not undermine the fact that adapting competency based medical education requires lots of effort and time of faculty, institutional commitment and the logistic challenge for implementation is huge.¹⁴ Institutions can take a lead and start working towards it while advocacy for the change to be adapted at National level calls upon significant role of the regulatory bodies.

The first step towards this, focusing on NCD competencies, could be identifying the actionable gaps in the pre-service curriculum and verify that to the national context. This will require workshops conducted by the national regulatory bodies like Medical Education Commission in Nepal and involving representative from different medical schools, medical educationist and public health experts. Efforts should be taken to address the identified gaps in the curriculum. Further, to reduce the gap between education and service delivery, the identified essential competencies need to be certified before the graduates are licensed to practice. The next step would be, to develop a monitoring tool at the national level, for evaluating the output following the revision of the pre-service curriculum and competency certification of the graduates.

Competency in NCD management ensures that future physicians have the necessary skills and knowledge to provide appropriate treatment and care for patients with NCDs. This includes prescribing medication,

managing complications, and providing lifestyle modification advice. By providing effective management and early detection of NCDs, healthcare systems can reduce the costs associated with chronic diseases. Additionally, effective patient education can reduce the burden of chronic diseases on healthcare systems by empowering patients to take responsibility for their health. This can ultimately lead to more efficient healthcare systems.

Conclusion

The lower middle-income countries with increasing burden of NCDs, requires their future health workforce to be appropriately trained on NCD related competencies to tackle the challenge. This can be achieved through a revision of the existing pre-service curriculum of health workforce. Attaining competency in NCD management is crucial for the medical graduates so that they can detect and manage chronic diseases effectively, provide appropriate treatment and care, educate patients about prevention and management, and reduce the burden of chronic diseases on healthcare systems. Therefore, it is essential that competency based NCD learning is integrated into undergraduate medical curricula to produce competent physicians who can address the increasing burden of chronic diseases worldwide.

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Conflict of Interest

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