

# Non-communicable diseases competencies in undergraduate curricula at medical university in Bhutan

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## Abstract

**Background:** This review study aimed to assess non-communicable diseases (NCDs) competencies in three existing curricula at Khesar Gyalpo University of Medical Sciences (KGUMSB), Bhutan.

**Methods:** A review study of the existing curricula for competencies in NCDs was carried out using the World Health Organization (WHO) NCDs competency framework in the three curricula at KGUMSB.

**Results:** NCD competencies for both medical doctors and community health workers were almost similar but the level of mastery in competencies differed between the two curricula. For nursing, most of the NCD competencies were missing.

**Discussion:** There was a lack in clarity on strategies to develop the listed competencies by learners in all three curricula.

**Conclusions:** There was a lack in clarity on strategies to build psychomotor and affective domains for numerous NCD competencies in the existing curricula. Some critical strategies such as work place-based assessment, simulation-based learning and entrustable professional activities could be incorporated in the revised curricula at KGUMSB.

**Keywords:** Non-communicable diseases; Community health worker; Nursing; Medical doctor.

## Introduction

Learning is not an event, it is a process. These learnings facilitate mental development, develop attitudes, and promote the acquisition of new physical skills as we perform activities of daily living. In Bloom's taxonomy these are known as cognitive, psychomotor and affective domains (Hoque *et al.*, 2016). Development of all three domains of Knowledge, Skills and Attitude (KSA) are of equal importance.

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Cognitive learning has Six Levels (*remembering, understanding, applying, analysing, evaluation and creating*), psychomotor domain (*perception, set, guided response, mechanism, complex overt response, adaptation and origination*) and affective domain (*receiving, responding, valuing, organization and characterization*) (Singh *et al.*, 2020).

The education program delivered through the curriculum must find a balance between the three domains of education. Traditionally, many educational programme curricula are more content-driven with limited focus on psychomotor and attitude domains (FoPGM, 2018; Tenzin *et al.*, 2018). The rapidly advancing medical technology, emerging new diseases and evolving health needs, signals to move from a traditional content-driven



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curriculum to a priority-based competency curriculum (Kim et al., 2015).

Competency based medical education consists of a set of competencies identified based on the expected roles the graduates. All aspects of teaching-learning and assessment are aligned towards development of the identified competencies.

Bhutan's journey in modern medicine began in 1956, and in 1974, the then Royal Institute of Health Sciences was established to address the shortage of Health Human resources with a program in Public Health and Nursing and Midwifery (Kim et al., 2015). Similarly, the Faculty of Postgraduate Medicine was established for starting undergraduate medical education in 2014 (FoPGM, 2018).

In Bhutan, nearly 70% of premature deaths in 2019 occurred due to NCDs. Further, STEPS survey 2019 reported that one in every four Bhutanese was hypertensive. Similarly, there are rising number of patients with diabetes, chronic respiratory disorders and mental health issues along with cancer patients. According to WHO, there are five known and well-established risk factors in NCDs such as alcohol, tobacco, unhealthy diet, physical inactivity and obesity (MoH, 2021). The pre-service curriculum plays a significant role in the training of health professionals in all the above areas of NCDs.

Therefore, the pre-service education curriculum must be fully equipped with the competencies and skills required for the management of NCDs in primary care settings. However, it is widely acknowledged that there is a gap between curriculum and NCD competencies required in the field. It is also true that the magnitude of this problem has never been assessed thus far. Based on the above given justifications, review of three existing curricula namely, draft MBBS curriculum (2010), pre-service nursing curriculum and community health curriculum at KGUMSB were reviewed for NCD competencies by use of the NCD competency framework developed by WHO-AIIMs team.

## Methods

This was a review study of existing curriculum for medical doctors (draft MBBS curriculum, 2010), nursing and community health workers at Medical University by desk review, faculty consultation and field visits to health facilities. The NCD competencies were mapped using the standard NCD framework prepared by WHO-AIIMS. Clearance was sought from the IRB (RB/Waiver-Exempt/PN21-044/2021-22/519). This exercise was undertaken between October 2021 and January 2022.

### Study Sites

First, a group of 21 faculty from nursing, community health and medical doctors were identified based on their involvement in the NCD and PEN HEARTS program. These reviewers utilized the WHO NCD framework to review the three existing curricula. Secondly, the review team conducted a field visit at health facilities at Punakha and Haa with interviews of Chief Medical Officer, NCD focal person and community health workers using the NCD framework to examine the gap between the curriculum framework and practice in the field.

### Study Tools and strategies

#### Steps of review of three existing curricula Step one

A two day workshop for 21 faculty members (7 Doctors, 7 Nurses and 7 Public health) was conducted to sensitize the professionals about the NCD competency framework (Table 1). The faculty members also attended an online course enabling better understanding of the NCD framework. Details are shown in Table 1.

#### Step two

These 21 faculty members were divided into three groups of MBBS, nursing and community health. These three groups reviewed the curricula for NCD related competencies, teaching-learning methods, assessment methods used and curricular alignment. The review was followed by plenary and large

group discussion to validate the findings of each group and other faculty members were also consulted for inputs.

#### Step three

Review was followed by field visit to Punakha Hospital and Samdingkha PHC, Haa hospital and Yangthang PHC. The review team interviewed the chief medical officer, nurses and community health workers using the NCD

framework to understand the discrepancies between the curriculum and the field practices.

#### Step four

The review documents were presented and discussed with 11 academic institutes from India, Nepal, Sri Lanka and Bangladesh. This exercise facilitated in common understanding and alignment as per the NCD competency framework.

**Table 1: Framework of 56 competencies in NCDs as proposed by WHO-AIIMS**

NCD Competency domains/areas	No. of sub-competencies	Details of sub-competencies
Hypertension and CVD	8	History taking, physical examination, total risk approach, Protocol based management, emergencies, counselling and appropriate referral.
Diabetes Mellitus	7	History taking, physical examination, total risk approach, Protocol based management, emergencies, counselling and appropriate referral.
Common Cancers	6	Identifying common presentation, examination, counselling, diagnosis and referral needs
Chronic Respiratory Diseases	8	History taking, physical examination, total risk approach, Protocol based management, emergencies, counselling and appropriate referral.
Lifestyle related counselling (Alcohol, tobacco, diet, Physical activity)	7	AUDIT, Brief interventions, 5As and 5Rs, screening, counselling
Self-care and Palliative care	7	Health education, behavioural changes and home-based care
Mental health (Common mental illnesses)	3	Screen, diagnose, and provide appropriate referral to patients with Depression, anxiety disorders and substance abuse.
Service delivery and decision making	5	Performance measures, Control rates, Dashboard, catchment areas
Health promotion	2	Health promotion aids and strategies and campaigns
Organization of NCD service delivery through people-centred approaches	4	Team based approach, clinical pathways, clinical mentorship, refill and recall, referral and counter referral,

#### Data Analysis Plan

The data analysis primarily was based on the NCD competency framework in ten core

competencies subdivided into 56 sub-competencies.

## Results

### Common characteristics of three curricula:

All three curricula were well designed to explicate and implicate core competencies required for a medical doctor, nurse and community health worker. The existing draft MBBS curriculum was drafted in 2010, nursing curriculum in 2017 and community health workers in 2015.

### Coverage of NCD competencies

The WHO-AIIMS NCD competency framework identifies 56 NCD competencies. Only 5 competencies in MBBS, 8 in nursing and 8 in Community health work curricula were fully captured. The rest were either partially captured or not captured at all. The three review teams deliberated in the plenary on these observations and decision was reached based on the consensus (as per the framework) as shown in Table 2.

**Table 2: List of competencies in three curricula**

KGUMSB	No of competencies (N - 56)		
	Fully covered (n)	Partial (n)	Not at all (n)
MBBS	05	18	31
Nursing	08	09	39
CHW	08	13	36

*n* – no of competency are taught using a particular teaching-learning method, one competency can be taught by using more than T/L methods.

Essential NCD competencies which were noticeably absent in all three curricula were basic counselling, health lifestyle counselling, self-care and palliative care, organization of

NCD services delivery through people centred approaches and data analysis, monitoring and performance evaluation with reporting as shown in Table 3.

**Table 03: Illustrating the broad topic wise and individual competencies listed**

Topic	Competencies
COPD & Asthma	Multiple departments introduced the concepts to building graded exposure
Healthy lifestyle counselling	In-depth content but scattered throughout the curriculum. Skill development part missing.
Self-care and Palliative care	Not much of PEN HEARTS incorporated, basic cognitive component only. Counselling and Palliative care-missing completely. Community medicine emphasis minimally on health promotion, risk reduction or physical activity.
Mental Health	Primarily left to Psychiatry Department with no integration of any sort.
Use of data in improving service delivery and decision making	Care organization and care delivery were missing – general concepts but practical application is missed out. Absence of specific competencies, methods of teaching and assessment.
Organization and Management of NCD Service delivery through people-centred approaches	People centered approaches of 7Rs ( <i>reach out, recall and reminder, refills, robust team, reliable lab, responsive referral</i> ) and 3Cs ( <b>continuous, coordinated and comprehensive care</b> )

The teaching learning methods in all three curricula reflected on the heavy content delivery (cognitive domain) as nearly 50% of

teaching methods were focusing on information gathering through lectures and group discussion as shown in Table 4.

**Table 4: Various teaching learning methods for development of NCD competencies at KGUMSB**

KGUMSB	Teaching/ learning methods				
	Lecture (n)	Small group discussion/ Group Exercise (n)	Community/ health systems visits; Bedside clinic; Skill lab (n)	Video demonstration; DOAP session* Simulation (n)	SDL - Self-directed learning (n)
MBBS	24	20	15	10	14
Nursing	16	16	9	8	10
CHWs	22	22	22	9	16

*n* – no of competency are taught using a particular teaching-learning method, one competency can be taught by using more than T/L methods; \*DOAP – demonstrate, observe, assist and perform

The Community health curriculum had the highest number of assessments both in frequency and also in terms of building the

appropriate competencies with case presentation, workbook and certification of performances as shown in Table 5.

**Table 5: Assessment methods (narrative) - no competency-based assessment**

KGUMSB	Assessment methods employed					
	Quiz (n)	OSCE/ OSPE (n)	FQ/ SQ (n)	Case/ family presentation; Viva-voce (n)	Checklist; Workbook (n)	Perform procedures for certification (n)
MBBS	12	3	16	20	3	1
Nursing	9	4	5	8	8	7
CHWs	16	13	20	17	10	16*

\**n* – no of competency are assessed by specific assessment method. One competency can be taught by using more than T/L methods; Level of integration in three curricula

There were low levels of integration within the curricula. In all three curricula of MBBS, Nursing and Community health the highest level of integration was parallel integration. The integration in curriculum is essential as higher the level of integration, better the learning and team and group learning culture.

## Discussion

Modern medical education in the last few decades has transformed from traditional content based and teacher driven to competency-based. Competency Based education uses “constructivism”- connects the gap between existing (inductive process) and new knowledge (deductive reasoning). The

key is identification of core competencies, appropriate teaching-learning methods to develop competencies comprehensive and continuous assessment system. The *learners are actors, rather than spectators* (Dennick *et al.*, 2016).

### a. NCD Competency mapping in curriculum

The curricula need to focus on clear strategies to build required competencies in the common NCDs, mental health, data analysis and use, health systems-based management of NCDs approach to healthcare services in an effort to prepare NCD ready graduates from KGUMSB (MOH, 2019).

### *b. Teaching-Learning Methods*

The curricula at KGUMSB must be revisited to correct the “erroneous” beliefs of the learners with correct scientific evidences (Dennick et al., 2016). The teaching methods were teacher oriented and content delivery focused. Problem-based learning (PBL) has been proven to create an environment of learning with opportunities to explore more. PBL encourages active learning with key ingredients being problem, question that the learner seeks to solve problem (Jones et al., 2019). PBL also ensures the development of cognitive knowledge, improved technical skills, reasoning abilities, learning group dynamics, attitudes and communication skills (Dasgupta et al., 2020). Other teaching methods include community based learning and case-based learning, similar to PBL (Mclean et al., 2016; Kelly et al., 2014). All these teaching methods could enhance in development of relevant competencies in common NCDs, community engagement among others.

### *c. Assessment methods*

The assessment mechanism in the existing curriculum is primarily focused on assessment of “Knows” with some degree of emphasis on “Knows How” by means of essay questions, role plays, assignments and “Shows How” by means of Sign outs, OSPE/OSCE. This is especially true for NCD related competencies (Norcini et al., 2003; Liao et al., 2019).

Therefore, assessment tools that assess the learner in real settings must be explored in the revision of the curricula. Two such assessment tools are work-place based assessment (WPBA) and entrustable professional activities (EPA) (Singh et al., 2020; Singh et al., 2013; Kadri et al.).

For instance, blood pressure and peak expiratory flow rate could be assessed with WPBA in a primary healthcare centre, it means learners are assessed in a resource limited and real setting. To enhance the learning, simulation-based learning sessions must be encouraged and given more representation in the curricula (Tenzin et al., 2018; Tenzin et al.,

2019). The existing assessment system of WPBA utilized in postgraduate program could be adopted with appropriate modifications.

### *Strengths and Limitations*

The exercise involved parallel reviews in 11 academic institutes from *Bangladesh, India, Maldives, Nepal and Thailand*. This is one of the first exercise to detail evaluation of existing curricula in relation to NCD competencies from the scope of content, teaching-learning methods, assessment and integration levels in the curriculum.

The major limitation was that only curricular documents were reviewed and assessment sessions were not observed. Therefore, it couldn't be ascertained whether competencies were achieved or not. Another limitation was that the field staff were not familiar with the concept of competency-based education.

### **Conclusions**

The existing curriculum of MBBS, nursing and community health workers are well designed with rich content to cover the NCD competencies. However, there was limited focus on “Shows How” and “Shows” of Miller's pyramid. Strategies must be adopted to reduce the gap between existing and new knowledge and to encouraged the learner to explore their own theories in NCD management in future revisions of curricula.

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