

# An innovative, integrated, and community based MBBS Curriculum: a humanistic and holistic approach for Karnali Academy of Health Sciences

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## ABSTRACT:

**Background:** With the mission of providing easy and accessible health services/facilities for the people of backward areas by producing qualified and skillful health professionals, Karnali Academy of Health Sciences (KAHS) has been established in 2011, by an Act of parliament of Nepal. In the way of fulfilling its mission, PCL nursing program (2014), PCL in General Medicine (2015), Bachelor in Public Health (2018) and Bachelor in Midwifery Sciences (2018) programs have already started successfully; and next goal of our Academy is to start MDGP and MBBS in near future. In this context of its academic progress, KAHS is developing an ideal MBBS curriculum by introducing the recent innovation in the field of medical education.

**Method:** This was the cross-sectional study conducting among 100 public, 50 medical students and 20 professors and faculties of TU, KU, PAHS and BPKIHS from June, 2018 to November, 2018. The data were collected with the help of three different set of semi-structured questionnaires. Moreover, we had gone through the MBBS curriculum of 10 Universities/Academy, and the data regarding the type of curricular strategies, credit hours and course contents of individual subject, academic calendar, schedule of community posting, and evaluation pattern were collect in the performa. The collected data were analyzed and presented in the tables.

**Result:** Present study found that out of 100 participants, almost all of the participants felt the need of one medical college and a well facilitated hospital in Karnali Province, especially in Jumla, with the qualified, skillful, patient-friendly medical doctors as well as other health professionals. After interviewed with the professors and faculties of various universities, we found that the integrated, community based and student centered curriculum had better level of understanding than the discipline based, teacher-centered MBBS curriculum. Out of the four prevailing MBBS curricula (TU, KU, PAHS and BPKIHS) in Nepal, all curricula incorporated the horizontal integration approach in basic sciences with early pre-clinical exposure and community posting. In addition to this, integrated MBBS curriculum of PAHS was fully problem-based, and community based.

**Conclusion:** Integrated, student-centered, community based, problem based as well as problem oriented innovative teaching-learning method outweigh the contemporary teacher-centered hospital-based learning in medical education. So, we would like to recommend the development of integrated MBBS curriculum based on the organ system for the proper implementation recent innovation of medical education.

**Keywords:** *Curriculum, MBBS, KAHS, Integrated, Community-based, Hospital-based, Problem-based, Problem-oriented, Student-centered*

## INTRODUCTION

With the mission of providing easy and accessible health services/facilities for the citizens of backward areas by producing qualified and skillful health professionals, Karnali Academy of Health Sciences (KAHS) has been established in 2011, by an Act of parliament of Nepal<sup>1</sup>. In the way of fulfilling its mission, PCL nursing program was established in 2014 followed by PCL in General Medicine (HA) in 2015<sup>2</sup>. Similarly, the Bachelor in Public Health (BPH) and Bachelor in Midwifery Sciences (BMS) program have been started recently in 2018<sup>1</sup>. KAHS has been preparing the next generation of health professionals and leaders to become vital contributors to the delivery and advancement of health care to those who are marginalized and living in backward areas. The prime concern of the Institute is to develop patterns of teaching in undergraduate and postgraduate health science education in all the branches so as to demonstrate a high standard of health science education. MDGP and MBBS programs are on its way to be started in near future.

The curriculum integration has become the hot topic of discussion among the medical educationist since the last half century. The lack of connections of basic concepts and inter-relationships of knowledge among the increased subspecialty of medical sciences have been frequently cited as the main reasons felt the need to move towards an integrated curriculum in medical schools<sup>3</sup>. Integration of curriculum is not just merging the similar topics; however it is amalgamation of the concepts of all subjects of basic sciences which breaks the barriers between individual disciplines<sup>4</sup> in order to provide students with better learning opportunities. It is an approach in teaching and learning method

that purposefully draws together knowledge, skills, attitudes and values from within or across subject areas to develop a more powerful understanding of key ideas. The need for integration has been advocated by many researchers, medical councils and in many reports on medical education<sup>5-7</sup>. The integrated curriculum could become student-centered learning by adopting the problem-based learning (PBL) which stimulate deep learning thereby enhancing the ability of visualization, and stimulates better understanding of complex biomedical principles<sup>8</sup>. Though there is the increasing trend of teaching basic integrated medical sciences by using PBL<sup>9</sup>, the teaching of integrated curriculum does not necessarily require the adoption of a problem-based approach to get the benefits of integration<sup>10-11</sup>. The objectives of this article was to explore how integration can be achieved avoiding commonly committed mistakes which can be used to integrate the existing curriculum for developing a ideal curriculum for the proposed MBBS program in Karnali Academy of Health Sciences.

## METHODOLOGY

This was the cross-sectional study conducted among 100 public, 50 medical students and 20 professors and faculties of TU, KU, PAHS and BPKIHS, from June, 2018 to November, 2018. The data were collected with the help of three different set of semi-structured questionnaires for public, professors/faculties, and for medical students. Then the different stakeholders; the people inhabited in Jumla, as well as dignitaries of the Karnali Province especially residing in Jumla for the need of MBBS course in KAHS were interviewed. Additionally, we had also

interviewed to the Professors and Faculties, medical students of Maharajgunj Medical Campus (MMC), Kathmandu University (KU), Patan Academy of Health Sciences (PAHS) and BP Koirala Institute of Health Sciences (BPKIHS), to find the strength and weakness and suggestion for the further improvement of their existing curriculum which were recorded in the preformed performa. Moreover, we had gone through the current curriculum of MMC, PAHS, KU, and BPKIHS to collect the data regarding the type of curricular strategies, credit hours and course contents of individual subject, academic calendar, schedule of community posting, and evaluation pattern. The collected data were analyzed and presented in the tables.

## RESULT

Present study found that out of 100 participants, almost all of the participants felt the need of one medical college and a well facilitated hospital in Karnali Province, especially in Jumla, with the qualified, skillful, patient-friendly medical doctors as well as other health professionals. After interviewed with the professors and faculties of various universities

who were especially experienced in curriculum development and implementation, we found that the integrated, community based and student centered curriculum had better level of understanding than the discipline based, teacher-centered MBBS curriculum.

Out of 10 curricula, the four prevailing MBBS curricula (TU, KU, PAHS and BPKIHS) in Nepal had incorporated the horizontal integration approach (more or less) in basic sciences with early pre-clinical exposure and community posting. Out of ten curricula, four MBBS curriculum (AIIMS, JIPMER, RGUHS and SLIM) were from Indian University, one was from Bangladesh and one is from oxford university. In addition to this, integrated MBBS curriculum of PAHS was fully problem-based, and community based, where as other universities were in the way of practicing the problem based approach of teaching. Although the four curricula of Indian Universities had the isolated model of curriculum, they were practicing the integrated approach of teaching-learning methods. The detail curricular strategies of various curricula are presented in the table 1.

**Table 1:** Curricular strategies of various curricula prevailing in Nepal as well as abroad

S.N.	University/ Academy	CBL	PBL	HBL	Exam. Pattern	Type of curriculum	TCH (hours)	TCH in Basic Sciences	TCH Clinical Sciences
1	TU <sup>12</sup>	Yes	No	Yes	Yearly	Integrated (Horizontal)	8221	4079	4142
2	KU <sup>13</sup>	Yes	Yes (Partial)	Yes	Semester	Integrated (Horizontal)	5620	2322	3298
3	BPKIHS <sup>14</sup>	Yes	Yes (Partial)	Yes	Yearly	Integrated (Horizontal)			
4	PAHS <sup>15</sup>	Yes	Yes (full)	Yes	Yearly	Integrated			
5	AIIMS <sup>16</sup>	Yes	No	Yes	Semester	Isolated			
6	JIPMER <sup>17</sup>	Yes	No	Yes	Yearly	Isolated		2876	
7	RGUHS <sup>18</sup>	Yes	No	Yes	Yearly	Isolated	1495	2768	
8	SLIMS <sup>19</sup>	Yes	No	Yes	Yearly	Isolated		2187	
9	BMDC <sup>20</sup>							2590	
10	Oxford <sup>21</sup>	Yes	Yes	Yes	Semester	Integrated (Fully)			
11	KAHS	Yes	Yes	Yes	Yearly	Integrated	5729	2717	3012

CBL: Community based learning

AIIMS: All India Institute of Medical Sciences

PBL: Problem based learning

JIPMER: Jawaharlal Nehru Institute of Postgraduate Medical Edu. & Research

HLB: Hospital based learning

RGUHS: Rajiv Gandhi University of Health Sciences

TCH: Total credit hours throughout the MBBS course

TCHCS: Total credit hours in clinical sciences

TCHBS: Total credit hours- in basic medical sciences

Table 2 and 3 showed the subject-wise distribution of credit hours in basic sciences and clinical sciences prevailing in various universities/academy. Similarly, table 3 showed the model of integration in basic medical sciences in BPKIHS. And table 5 showed the proposed modality of horizontal integration in the basic medical sciences, in the curriculum of MBBS, which is based on the pattern of integration in other universities as well as academy.

**Table 2:** Subject-wise distribution of credit-hours of Basic Sciences in various Universities/ Academy

SN	Subjects	Subject-wise Credit Hour in All Subjects of Basic Medical sciences (in hours)									
		TU	KU	PAHS	BPKIHS	AIIMS	JIPMER	RGUHS	SLIMS	BMDC	KAHS
1	Anatomy Th.	*	302	--	139	103	210	240	217	180	200
	Anatomy Pra.	*	170	--	195	438	502	410	433	470	325
2	Physiology Th.	*	186	--	126	---	480	240	160	260	200
	Physiology Pra.	*	120	--	87	---		240	32	120	120
3	Biochemistry Th.	*	200	--	95	---	240	160	80	204	200
	Biochemistry Pra.	*	100	--	72	---		80	160	66	75
4	Pathology Th.	*	214	--	107	---	300	156	100	100	200
	Pathology Pra.	*	86	--	117	---		144	200	150	75
5	Microbiology Th.	*	128	--	90	51	250	156	83	156	150
	Microbiology Pra.	*	80	--	72	118		94	167	64	75
6	Pharmacology Th.	*	161	--	130	---	300	156	100	160	150
	Pharmacology Pra	*	106	--	90	---		144	200	50	75
7	Community Med.Th	365	120	--	16	---	260 + 8W	174	83	290	200
	Practical + Field	1825	125 3W	--	---	---		86 + 6W #	173	40 days	5 + 10 W #
8	Preclinical Medicine and Medical Humanity	Th.	297	110	--						74
		Pra.		--	--						148
Grand Total Cr hrs		4079	2262				2876	2768	2187	2590	2945

**Note:** The symbol --- means the credit hour is not available

\* Aggregate Credit hours for all subjects of IBMS in TU, Theory = 1089, Practical = 800

# For calculating credit hours of community medicine, six working days per week with 8 hours per day

**Table 3:** Subject-wise distribution of credit-hours of Clinical Sciences in various Universities/ Academy

S.N.	Subjects	Subject-wise Credit Hour in Basic Medical sciences									
		TU	KU	PAHS	BPKIHS	AIIMS	JIPMER	RGUHS	SLIMS	BMDC	KAHS
1	Medicine and Allied Subjects** Theory	190+90	230	---	---	---	370	124	100	192	250
	Medicine and Allied Clinical	845+444	500	---	---	---		246	200	1008	597
2	Pediatrics Theory	105	505	---	---	---	100	33	33	50	100
	Pediatrics Practical	347		---	---	---		67	67	240	240
3	Surgery & Allied Subjects*** Theory	190+30	1015 with ortho	---	---	---	350	117	100		200
	Surgery Clinical	497+84		---	---	---		233	200		492
4	ENT Theory	45	65	---	---	---	70	23	33	45	50
	ENT Clinical	162	135	---	---	---		47	67	192	160
5	Ophthalmology Theory	45	80	---	---	---	100	33	33	40	50
	Ophthalmology Clinical	162	120	---	---	---		67	67	192	160
6	Obs. & Gynae Theory	110	648	---	---	---	300	100	100	85	105
	Obs. & Gynae Clinical	467		---	---	---		200	200	158	268
7	Orthopedics Theory	45		---	---	100	33	33		50	
	Orthopedics Clinical	162		---	---			67	67		160
8	Forensic Medicine & Toxicology Th.	60	60	--	---	55	100	70	33	110	100
	Forensic Medicine & Toxicology Pra.	60	20	--	---	40		35	67	40	30
Grand Total (Cr hrs)		4140	3378	---	---	1470	1470	1495	1400	3612	3012

Note: \*The symbol --- means the credit hour is not available

\*\*Medicine and Allied Subjects: It includes psychiatry, Emergency Medicine, Dermatology

\*\*\*Surgery and Allied Subjects: It includes Radiology, Dentistry and Anesthesia

**Table 4:** Modality of Horizontal Integration in the Basic sciences of BPKIHS<sup>3</sup>

Year	Unit	Integrated Subjects	Theory (hours)	Practical (hours)	Clinical Practice (hrs)
First Year	Unit 0	General Concepts	142	147	15
	Unit 1	Genetics	21	3	24
		Growth & Development	9	0	
		Immunology	26	9	
		Blood	55	78	
		<b>Total</b>	<b>111</b>	<b>90</b>	
	Unit 2	Cardiovascular System	49	42	18
		Respiratory & Environment, ANS	66	27	
		<b>Total</b>	<b>115</b>	<b>69</b>	
Second Year	Unit 3	GIT, Hepatobiliary & Nutrition	97	69	42
	Unit 4	Endocrine & Reproductive System	77	54	12
		Kidney and Fluid Balance	29	36	
		Integumentary System	14	12	
		<b>Total</b>	<b>120</b>	<b>102</b>	
	Unit 5	Musculoskeletal system	39	54	60
		Nervous system	74	66	
		Special Senses	34	21	
		<b>Total</b>	<b>147</b>	<b>141</b>	
	Unit 6	Multisystem seminar			
<b>Grand Total</b>			<b>732</b>	<b>618</b>	<b>171</b>

**Table 5:** Model of Horizontal Integration of Basic Medical Sciences (IBMS) for MBBS Curriculum for KAHS

SN	Integrated Basic Medical Sciences	Included organ systems in each papers	Marks Distribution	Topic & Subtopic of respective system	Course contents of each subtopic	Learning objectives of each subtopic	T/L Method, Evaluation Tools	Allocated hours (Credit hours)
1	IBMS - I Theory	1. Basic concepts 2. Cell Biology, Growth, Development and Genetics	100					
2	IBMS - II Theory	3. Musculoskeletal System 4. Neurosensory System	100					
3	IBMS - III Practical	Includes the Practical of IBMS I and IBMS II	200					
4	IBMS - IV Theory	5. Cardiovascular & Hemopoietic 6. Blood and Immune System	100					
5	IBMS - V Theory	7. Respiratory system 8. Renal and electrolyte system	100					
6	IBMS - VI Theory	10. Reproductive system 11. Endocrine system	100					



7	IBMS - VII Theory	12. GIT and Hepatobiliary 13. Nutrition & Metabolism	100					
8	IBMS - VIII Practical	Includes the Practical of IBMS IV and IBMS V	200					
9	IBMS - IX Practical	Includes the Practical of IBMS VI and IBMS VII	200					

**Table 6:** Community Medicine for MBBS Curriculum for KAHS

SN	Community Medicine	Included subspecialty in each papers	Full Mark	Course contents of each subtopic	Learning objectives of each subtopic	T/L Method, Evaluation Tools	Allocated hours
1	Community Medicine - I	1. Human and Medicine	100				
		2. Concepts of Health & Disease					
		3. Basic Epidemiology					
		4. Biostatistics					
		5. Demography					
2	Community Medicine - II	1. Health Promotion and Education	100				
		2. Behavior science, and Medical sociology & anthropology					
		3. Primary Health Care, MDG, SDG					
		4. Human sexuality, family planning & family health					
		5. Community Health Diagnosis Theory + Practical (field practice)					
3	Community Medicine - III	1. Applied epidemiology	100				
		2. Health research and Medical Ethics					
		3. Human Nutrition					
		4. Environmental and occupational health					
4	Community Medicine - IV	1. Health economics, health financing and social health insurance	100				
		2. Health service, and health programs					
		3. Health management					
		4. Family health exercise Field					
5	Community Medicine Field - V	Comprehensive health service, and health programs management:	100				
		1. Hospital management field					
		2. Provincial, Local & Municipality Health System Management					

## DISCUSSION

Medical curriculum is very extensive, and students are supposed to learn many subjects during the MBBS course. In traditional or conventional medical educational system, the students absorb the information passively which develops critical thinking, problem solving, and decision making skills less efficiently. Various studies suggest that integrated teaching was found more effective than traditional teaching<sup>3,22</sup>. Integrated curriculum aims to provide students with better learning opportunities that will facilitate the development of knowledge. Recent studies on medical education showed that integrated, problem-based, community-based student-centered curriculum has to be adopted to overcome the problems of conventional system of medical education which bridges the gaps between theory and practice, and hospital based medicine and community medicine<sup>22</sup>. The aim of the curriculum for the MBBS degree is to produce a well rounded medical graduate, who as a result of the five and half years of undergraduate education program in medical sciences will be competent to carry out preventive, promotive, curative and rehabilitative functions expected of a basic doctor. The accent of the curricular approach is community based, student centered, and integrated. Moreover, the most of the aspect of the curriculum is problem oriented and to encourage the student centered learning, problem based learning is introduced in some of the topic of every subject in integrated basic as well as clinical sciences. In addition, the emphasis has been given on practical learning and hand on experience. The proposed curriculum of MBBS of KAHS is integrated (rather than discipline based), problem oriented (rather than subject based), student centered (rather than teacher centered) and community based (rather than hospital centered).

Most of the MBBS Curriculum prevailing in Nepal like KU, BPKIHS and TU 12-14 has been following horizontal integration in basic medical sciences. PBL is another innovative teaching-learning method for proper adoption of integrated curriculum. Curriculum of PAHS<sup>15</sup> is problem-based and integrated so as to ensure student-centered teaching-learning strategies.

Hence, our academy proposed to adopt similar type of innovative curriculum from where students can get more benefit. To implement the innovative type of curriculum, we are planning to include hospital postings, interactive lectures, daily sessions devoted to seminars, group discussions, and problem oriented learning and integrated teaching sessions, small group discussion, project work and field work. For assuring the quality of medical graduates, and for the real evaluation of the students, the formative and summative assessment of the student would be done. The internal assessment would carry 20% whereas final examination would carry 80% of the full marks. The questions would be 20% MCQ (Multiple Choice Question), 15% PBQ (Problem Based Question), 35% SAQ (Short Answered Question) and 25% MEQ (Modified Essay Question), and 5% marks is allocated for the maintenance of log-book. Similarly, the practical or clinical of the various subjects will be conducted as practical demonstration, OSPE or OSCE model, along with clinical long and short cases.

## CONCLUSION

Student-centered, problem-oriented, and community based innovative teaching-learning method outweigh the traditional teacher-centered hospital-based learning in medical education. So for the development of organ system-wise integration of medical curriculum and its proper implementation would benefits the medical students and reduces the drawback of contemporary traditional curriculum.

## REFERENCES

1. Karnali Academy of Health Sciences. About Institution. [cited 2018 september 23]; Available from: <http://kahs.edu.np/about-institution>.
2. Marahatta M. Milestones of Medical Education in Karnali Academy of Health Sciences. Journal of Karnali Academy of Health Sciences. 2018;1(1):1-3.
3. Atwa HS, Gouda EM. Curriculum Integration in Medical Education: A Theoretical Review. Intellectual Property Rights: Open Access [Internet]. 2014 [cited 2019 Jan 20];2(2). Available from: <http://www.esciencecentral>.



- org/journals/curriculum-integration-in-medical-education-a-theoretical-review-ipr.1000113.php?aid=25085
4. Kadirvelu A, Gurtu S. Integrated Learning in Medical Education: Are Our Students Ready? Medical Science Educator. 2015 Dec;25(4):549–51.
5. Association of American Medical Colleges 1984. Physicians for the twentyfirst century: Report of the project panel on the general professional education of the physicians and college preparation for medicine. J Med Educ 59:1–28.
6. Anderson MB, Swanson AG. 1993. Educating medical students: The ACME-TRI report with supplements. Acad Med 68(suppl):S1–S46.
7. General Medical Council 2009. Tomorrow's doctors: Outcomes and standards for undergraduate medical education. London: General Medical Council.
8. Dahle LO, Brynhildsen J, Fallsberg MB, Rundquist I, Hammar M. 2002. Pros and cons of vertical integration between clinical medicine and basic.
9. Wilkerson L, Stevens CM, Krasne S. 2009. No content without context: Integrating basic, clinical, and social sciences in a pre-clerkship curriculum. Med Teach 31:812–821.
10. Harden RM. The integration ladder: a tool for curriculum planning and evaluation. Medical Education. 2000 Jul;34(7):551–7.
11. Harden RM, Sowden S, Dunn WR. 1984. Some educational strategies in curriculum development: The SPICES model. ASME Medical Education Booklet number 18. Med Educ 18:284–297.
12. Tribhuvan University, Institute of Medicine, Curriculum for MBBS, National Centre for Health Professional Education; Maharajgunj, Kathmandu, Nepal; 2008, Reprint 2011; 1-220.
13. Kathmandu University, School of Medical Sciences, Curriculum for MBBS; Revised Version 2011;1-263.
14. The MBBS Curriculum of B.P. Koirala INstitute of Health Sciences, Dharan, Nepal; Second Edition; 2014; 1-254.
15. Patan Academy of Health Sciences, School of Medicine, MBBS Curriculum; 2008, Revised Version 2014 & 2016; 1-245.
16. Syllabus of MBBS at the AIIMS; All india Institue of Medical Sciences, Ansari Nagar, New-Delhi; Second Edition, 2005; 1-167.
17. Jawaharlal Institute Of Postgraduate Medical Education & Research (Jipmer), Puducherry-605 006. Curriculum MBBS Course, 2008-2009; 1-198.
18. Revised Ordinance Govering MBBS Degree Course and Curriculum, RGUHS (Rajiv Gandhi University of Health Sciences), Karnataka, Bangalore. Second Reprint Edition, 2009; 1-146.
19. Sri Lakshmi Narayana Institute of Medical Sciences, Regulation & Syllabus for MBBS Coure, Bharath University Chennai; 2012: 1-208.
20. MBBS Curriculum, Bagaladesh Medical and Dental Council, Centre for Medical Education (CME) IPH Building (2nd floor), Mohakhali, Dhaka-1212, Bangladesh;2002:1-538.
21. Oxford University, Medical Sciences Division, Course structure: Available from: 2018; <https://www.medsci.ox.ac.uk/study/medicine/pre-clinical/structure>.
22. Shah V, Jain U. The effectiveness of integrated teaching over traditional teaching in third MBBS students. International Journal of Medical Science and Public Health. 2016;5(7):1430.