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Original Research Article

An analysis of MUHS MBBS community medicine theory examination papers I and II as per blue printing perspective

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ABSTRACT

Background: Blue print is a scientific tool to set an examination question paper. In this study, an attempt has been made to know whether the MUHS MBBS community medicine theory examination papers (I and II) are representative of the MUHS syllabus.
Methods: MUHS community medicine examination papers were collected from various sources. The syllabus is declared by MUHS for both the papers. I conveniently divided each paper syllabus into 14 divisions as per chapters given in Park's Textbook of Preventing and Social Medicine and MUHS suggestions. A working guideline of 'question paper analysis' was framed and validated by fellow faculties. The question papers were grouped into 4 categories based upon the number of deficiency scores: good (0 to -1), fair (-2 to -3), unsatisfactory (-4 to -5) and poor (-6 and below).
Results: In paper I (sections 'B+C'), total 33/35 papers were analyzed. 'Good papers' were 7 (21%), 'fair papers' were 14 (42%), 'unsatisfactory papers' were 8 (24%) and 'poor papers' were 4 (12%). In paper II (sections 'B+C'), total 33/35 papers were analyzed. 'Good papers' were 2 (6%), 'fair papers' were 17 (52%), 'unsatisfactory papers' were 9 (27%) and 'poor papers' were 5 (15%). MCQ papers (22/70) analysis showed that 13(59%) MCQ papers were good, 7(32%) were fair and 2 (9%) were unsatisfactory.
Conclusions: The paper-setting at MUHS community medicine paper I and paper II is not appropriate for syllabus representation.

Keywords: MUHS MBBS community medicine theory examination question papers I and II, LAQs, SAQs, MCQs, Blue printing

INTRODUCTION

Many a times, after MUHS community medicine theory examinations, when I read examination paper, my immediate impression was that syllabus was not represented appropriately. Some chapters were over-represented and some chapters were not touched at all. My observations were just casual observations or they really held water-was a dilemma for me. Hence, I decided to take the bull (dilemma) by horns and check the validity of my observation. The objective of the study is to get the answer of the question, 'Are the MUHS MBBS community medicine examination papers (both I and II) are representative of the syllabus?'[1]

METHODS

Permission was sought from the ethical committee of the college. Information about MUHS community medicine theory examination paper and paper setting were collected from various sources (visits, interviews etc.).[1-3,5]

Study design

Type of study: Cross sectional observational study.

Study period: This study involved MUHS (Maharashtra University of Health Sciences) MBBS community medicine question papers I and II from winter 2001 to winter 2018.

Materials: Past MUHS community medicine examination papers from various sources and the MUHS syllabus.[1-3]

Both the question papers (I and II) comprise 3 sections. Section A contain 30 MCQs. section B contains (11 SAQs, question 2 and 3) and section C (3 LAQs, question 4, 5, 6). Thus SAQs and LAQs together make a total of 14 questions. Hence, for convenience, the syllabus for each paper was divided into 14 divisions, as per Park's Textbook of Preventing and Social Medicine and MUHS circular.[4,5] Thus there were 14 (LAQS+SAQs) against 14 divisions of syllabus. This makes paper setting easy i.e. there should be 1 SAQ or LAQ from each division. Assessment method was framed and validated by fellow faculties.

Blue print is a three dimensional chart showing the layout of question paper.[6] It is a templet to construct questions as shown in Table 1. In this study, an attempt has been made to know whether the MUHS MBBS community medicine question papers (I and II) are representative of syllabus. Blue printing templet is shown in Table 1.

Table 1: A blue print templet.[6,7]

Chapters	LAQs			SAQs			MCQs		
	R	C	A	R	C	A	R	C	A
Order of setting: LAQ-first, SAQ-second, MCQ-last									
R=recall-25%; C=comprehension-50%; A-application-25%									

The Table 1 shows 4 columns, first column is 'name of the chapter/division of syllabus', second column is LAQs (long answer questions), third column is SAQs (short answer questions) and the fourth column is MCQs (multiple choice questions). Each column is again subdivided into 3 which are recall (R), comprehension (C) and application (A).

Order of question setting: LAQs should be set first, followed by SAQs; MCQs should cover large number of learning outcomes. There should not be overlapping.[8]

Included: Only representation of syllabus was assessed, only MUHS community medicine question papers, SAQs+LAQs sample size: (33/35) 94% and MCQs sample size: (11/35) 31%.

Not included: Recall-comprehension-application analysis, difficulty (facility value) and discrimination analysis, must know-desirable to know-nice to know analysis and item analysis.

Guidelines for dividing chapters

Supramajor chapter**:** 3 weightage, example: 'communicable disease'. Major chapters**:** 2 weightage, example 'Nutrition and Environmental and Health'. Medium chapters: 1 weightage, example: 'International Health'. Minor chapters group: 1 weightage, example: Hospital Waste Management+Genetics+Disasters+Organ Donation.[5]

The 14 divisions are shown in Table 2 as following.

Table 2: 14 divisions of paper I and II for analysis of question paper analysis.

S. no	Divisions: community medicine paper I	Divisions: community medicine paper II
1	Concept of health and disease+man and medicine+SDG	Health programmes in India
2	Concept of health and disease+man and medicine+SDG	Health programmes in India
3	Epidemiology and screening for diseases	Demography and family planning
4	Epidemiology and screening for diseases	Demography and family planning
5	Communicable diseases	Preventive medicine in obstetrics, pediatrics and geriatrics
6	Communicable diseases	Preventive medicine in obstetrics, pediatrics and geriatrics
7	Communicable diseases	Nutrition
8	Non-communicable diseases	Nutrition
9	Medicine and social sciences	Occupation and health
10	Medicine and social sciences	Mental health
11	Environment and health	Communication for health education
12	Environment and health	Health planning and management+SDG
13	Health information and basic medical statistics	Health care of the community
14	Hospital waste management+genetics and health+disaster management+brain death and donation[5]	International health

Marking system:

(1) SAQs were given 1 weightage and were posted at 1 place; (2) LAQs were given 2 weightage and posted at 2 places, for major and supra-major chapters. After posting all 14 'SAQs+LAQS' the analysis was done as following: (i) no questions from a chapter: '-1' score, (ii) unstructured LAQ '-1' score. Structured LAQs are more reliable, more valid, more objective and more suitable for problem solving, (iii) out of syllabus questions: '-1' score.[9]

Depending upon the number of deficiencies, the question papers were classified as Table 3.

Table 3: Classification of the analysis of question papers.

Criteria	Good	Fair	Unsatis-factory	Poor
Scores	-1 and 0	-2 and -3	-4 and -5	-6 and below

Classification is based on decreasing scores (increasing deficiencies).

Procedure

Example of analysis of community medicine examination paper

'MUHS community medicine theory examination paper I' of 'summer 2009' has been analyzed for illustration. This question paper was deliberately selected as it has structured LAQs. The question paper comprised,

SAQs

Question (2) any 3/5: (a) assessment of filaria control; (b) investigation of food poisoning; (c) indicators of health; (d) types of RCTs e-emporiatrics.

Question (3) any 4/6; (a) modes of interventions; (b) chikungunya fever; (c) health information system; (d) herd immunity; (e) effects of noise exposure; (f) overcrowding.

LAQs

Question (4): (a) What is sanitation barrier? (b) draw a neat diagram for the same (3); (c) explain how it helps in the prevention of diseases with suitable examples?

Question (5): (a) Describe the epidemiology of malaria (b) what measures are implemented in India for prevention and control of this disease? (c) what measures are implemented for international travels? (1)

Question (6): (a) define air pollution (1.5); (b) describe sources of air pollution (1.5); (c) monitoring of air pollution (1.5); (d) effects of air pollution (1.5); (e) prevention and control (2).

The analysis of the question paper has been shown in the Table 4 as following.

Table 4: The analysis of the question paper.

S. no	Division	Questions
1	Concept of health and disease+man and medicine+SDG	2c SAQ
2	Concept of health and disease+man and medicine+SDG	3a SAQ
3	Epidemiology and screening for diseases	2d SAQ 3d SAQ
4	Epidemiology and screening for diseases	2e SAQ 5 LAQ
5	Communicable diseases	2a SAQ
6	Communicable diseases	2b SAQ
7	Communicable diseases	3b SAQ
8	Non-communicable diseases	-1
9	Medicine and social Sciences	-1
10	Medicine and social Sciences	-1
11	Environment and health	3e SAQ 4 LAQ
12	Environment and health	3f SAQ 6 LAQ
13	Health information and basic medical statistics	3c SAQ
14	Hospital waste management+genetics and health+disaster management+brain death and organ donation[5]	-1
	Structured LAQs	Yes
	Total score	-4
	Remark	Unsatisfactory

In above Table 4, 'summer 2009 community medicine paper I' questions are posted against the 14 divisions of community medicine syllabus. It is evident from the table that, (a) division 'epidemiology and screening for diseases' should have ideally only 2 (LAQs or SAQs), but it has 3 SAQs and 1LAQ, a total of 4. Thus 'epidemiology+screening for diseases' division is over presented (4 questions against 2 questions expected), (b) similarly the division 'environment and health' should have only 2 questions (LAQs/SAQs), but it has 4 (2 LAQs+2 SAQs). Thus over presented by 2 questions. (c) This has resulted in 4 divisions {medicine and social sciences (2), non-communicable diseases (1) and the minor group (1)}, not having any question at all. The strong positive aspect of this question paper is structured LAQs. Structured LAQs are more valid, more objective, more reliable and more suitable for problem based question. The score is '-4' meaning the question paper

setting is unsatisfactory. Similarly other question papers were analyzed.

RESULTS

Table 5 shows the analysis of MUHS MBBS community medicine theory paper I (section B and section C): total 33/35 (94%) were analysed. 7/33 (21%) question paper settings were good, 14/33 (42.42%) question paper settings were fair, 8/33 (24.24%) question paper settings were unsatisfactory and 4/33 (12.12%) question paper settings were poor.

Table 6 shows the analysis of MUHS MBBS community medicine theory paper II (section B and section C): total 33/35 (94%) were analysed. 2/33 (6%) question paper settings were good, 17/33 (52%) question paper settings were fair, 9/33 (27%) question paper settings were unsatisfactory and 5/33 (15%) question paper settings were poor.

Table 5: Analysis of community medicine paper I (section B and C).

	Good	Fair	Unsatisfactory	Poor
Question Papers	S: 6, 7, 10 W: 3, 5, 6, 10	S: 2, 9, 13, 15, 16, 18 W: 2, 7, 9, 12, 14, 16, 17, 18	S: 11, 12, 14, 17 W: 4, 8, 11, 13	S: 3, 5 W: 1, 15
Frequency	7	14	8	4
%	21.21	42.42	24.24	12.12

Keys: S=summer, W=winter, 6 means 2006, 10 means 2010 and so on.

Table 6: Analysis of community medicine paper ii (section B and C).

	Good	Fair	Unsatisfactory	Poor
Question Papers	W: 1, 8	S: 2, 5, 7, 9, 11, 14, 16, 18 W: 3, 4, 6, 7, 9, 14, 16, 17, 18	S: 3, 6, 15, 17 W: 2, 5, 10, 11, 15	S: 10, 12, 13 W: 12, 14
Frequency	2	17	9	5
%	6.06	51.51	27.27	15.15

Keys: S=summer, W=winter, 2 means 2002, 15 means 2015 and so on.

Table 7: Analysis of community medicine paper I (section A).

	Good	Fair	Unsatisfactory	Poor
Question Papers	S18, W17, S16, S15, S13	S17, W15, W14, W13	W16, S14	nil
Frequency	5	4	2	nil
%	46	36	18	nil

Keys: S=summer, W=winter, 18 means 2008, 17 means 2017 and so on.

Table 8: Analysis of community medicine paper II (section A).

	Good	Fair	Unsatisfactory	Poor
Question Papers	S-13, 16, 17, 18 W-13, 14, 15, 16	S-14, 15 W-17	nil	nil
Frequency	8	3	nil	nil
%	73	27	nil	nil

Keys: S=summer, W=winter, 16 means 2016, 15 means 2015 and so on.

Table 7 shows the analysis of MUHS MBBS community medicine theory paper I MCQs (section A): total 11/35 (31%) were analysed. 5/11 (46%) question paper settings were good, 4/11 (36%) question paper settings were fair, 2/11 (18%) question paper settings were unsatisfactory.

Table 8 shows the analysis of MUHS MBBS community medicine theory paper II MCQs (section A): total 11/35 (31%) were analysed. 8/11 (73%) question paper settings were good and 3/11 (27%) were fair.

DISCUSSION

Thorndike's law of effect state 'students learn what is asked and not what is taught'. Sergiovanni and Starratt observe, 'assessment is the tail that wags the curriculum dog'.[10,11] As per Burdick 'education is assessment and assessment is education'.[12]

The World Federation of Medical Education standards for quality improvement state that the reliability and validity of assessment methods should be documented and evaluated and new assessment methods developed.[12]

George miller has stated, 'It was the examination system rather than educational objectives, curriculum organization or instructional techniques that had the most profound impact upon student learning. For no matter how appealing the statement of goals, how logical the programme organization, how dazzling the teaching methods, it was the examination that communicated most vividly to students what was expected from them.[6]

Mehta and Ingole have mentioned, 'often the teacher sets the question paper at the last minute or without proper planning and if the question paper does not contain the requisite attributes, it defeats its very purpose.[6]

The above statements, vividly tell the importance of examination system. It also implies that questions paper should be based on the science and art of blue printing. The theory question papers should be representative of the syllabus. In my study, I found the many times questions papers are not up to the mark. A whopping 42% question papers of community medicine paper I (SAQs+LAQs) were not acceptable (unsatisfactory 27%+, poor 15%). Similarly for community medicine paper II the percentage of not acceptable question papers were 36% (unsatisfactory 24%+, poor 12%). MCQs setting was better where unacceptable papers were only 2 (9%).

However, my study needs to be supported by similar study in other subjects and at other universities. It is also expected that someone to analyze the question papers differently.

The quality of question paper is better if % of application and comprehension type questions are more.

The common irregularities in MUHS MBBS theory examination papers found in this study were: (1) some chapters were over represented, (2) some chapters were totally neglected, (3) sometimes questions were out of syllabus (from other paper), (4) unstructured LAQs.

CONCLUSION

MBBS MUHS community medicine theory question papers were not acceptable as per blue print perspective.

Recommendations

- Study at other universities and other subjects for better understanding of the problem.
- Sufficient time should be allotted to the paper setters.
- Single person or same team should set all 3 sections of the examination paper.
- MUHS should revise the methodology of paper setting as per 'blue printing' guidelines.
- MUHS should train the question paper setters as per above guidelines.
- Training in medical education technology is very vital for making of a good teacher. Good at research doesn't mean good at teaching. Hence, National Medical Commission should also include medical education technology knowledge component for promotion because the quality of medial teacher will be as per the quality of 'promotion criteria.' My study demonstrates that Medical Council of India (erstwhile)/National Medical Commission promotion criteria are not adequate and misdirected. Let the teachers do teaching (nation building) and the researchers do the research.

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