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RESEARCH ARTICLE

Analysis of undergraduate pharmacology annual written examination papers at Pt. B. D. Sharma University of Health Sciences Rohtak

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ABSTRACT

Background: Written examinations are the most commonly employed methods for assessing the knowledge and clinical competence of undergraduate medical students. The assessment tools commonly employed in the theory paper are reasoning and short note type of questions. However, a few disadvantages such as less number of questions, unfair representation or distribution of topics, different difficulty level of questions, vague questions are often encountered in question papers of written examinations. **Aims and Objectives:** To evaluate the content validity/adequate coverage of different subdivisions of pharmacology in undergraduate written examination. **Materials and Methods:** For the analysis of written examination, all question papers of pharmacology second professional MBBS examination of Pt. B. D. Sharma University of Health Sciences from 2006 to 2015 were examined. In this retrospective study, we evaluated the pharmacology annual university theory examination question papers of II nd MBBS students. The students have to answer two question papers: Papers I and II, each being of 40 marks. **Results:** It was observed from the question papers that major systems such as autonomic nervous system, cardiovascular systems, central nervous system, and antimicrobials had almost equal weightage throughout the 10 years. However, some important topics such as anticancer drugs, analgesics (autacoids), immunosuppressants (miscellaneous) were not at all covered in many consecutive years (2011-2015). **Conclusion:** Assessment should become an instrument for promoting growth rather than simply measuring it. It should not be used for merely classification, grading, and certification. Therefore, methods like test blueprinting and table of specifications should be used during test construction process to improve the assessment system.

KEY WORDS: Pharmacology; Undergraduate; Written Examination

INTRODUCTION

In education, assessment is employed for several purposes: To improve teaching learning process, to improve learning, and to ascertain the level of achievement of learning. Since assessment gives insight into the process of students' learning, therefore, it becomes an important component of medical education and an integral part of curriculum of a course.[1] Medical education endeavors to impart holistic training and to deliver effective skills to its students, in a manner that encompasses five levels of Bloom's classification at all stages of education.[2] Due to vastness of syllabus and no one proven method to impart this knowledge, there is a need to determine the most acceptable and practicable method to assist trainers while they engage with their students for a topic of instruction. Curriculum defines assessment and for assessing various domains of learning, different methodologies are being explored and practiced by

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educators.[3] Written examinations are the most commonly employed methods for assessing the knowledge and clinical competence of undergraduate medical students. The assessment tools commonly employed in the theory paper are reasoning and short note type of questions. However, a few disadvantages such as less number of questions, unfair representation or distribution of topics, different difficulty level of questions, vague questions are often encountered in question papers of written examinations.

Content validity of an assessment refers to the extent to which a test actually measures the intended content area.[4] Adequate coverage of the course content is necessary for the validity of assessment. Setting a balanced question paper with respect to content validity is the first priority of any assessment.

This study was done to see the content validity/adequate coverage of different subdivisions of pharmacology written examination.

MATERIALS AND METHODS

For the analysis of written examination, all question papers of pharmacology second professional MBBS Examination of Pt. B. D. Sharma University of Health Sciences from 2006 to 2015 were examined. In this retrospective study, we evaluated the pharmacology annual university theory examination question papers of IInd MBBS students. The students have to answer two question papers: Papers I and II, each being of 40 marks there are 6 questions in each paper, each containing 3-4 subdivisions. Thus for analysis, we examined 18-20 subdivisions per paper, in all, 120 questions (360-400 subdivisions). We analyzed all the questions for allocation of marks, their frequency of occurrence and weightage to content areas as regards to the syllabus and expressed them as percentage.

RESULTS

A total of 20 question papers (Papers I and II) comprising 394 subdivisions of 120 questions from 2006 to 2015 of second professional MBBS pharmacology examination were analyzed. It was observed from the question papers that major systems such as autonomic nervous system, cardiovascular systems (CVS), central nervous system (CNS), and antimicrobials had almost equal weightage throughout the 10 years. However, some important topics such as anticancer drugs, analgesics (autacoids), immunosuppressants (miscellaneous) were not at all covered in many consecutive years (2011-2015). Table 1 shows frequencies of coverage of different systems of pharmacology in 20 question papers of the second professional examination. Table 2 shows the frequency of coverage of different systems of pharmacology in the question papers of individual examinations.

DISCUSSION

In this study, autonomic nervous system and cardiovascular system in paper I and chemotherapy and central nervous system in paper II were the topics which received high weightage consistently. While certain aspects such as nonsteroidal anti-inflammatory drugs (NSAIDS-autacoids), anticancer drugs and miscellaneous (immunosuppressants, kidney, vaccines, and chelating agents) remained uncovered in a few papers.

Similar observations have been made in previous studies which also stress on the need of guidelines for proper distribution of weightage to the content areas.[1,5] In a recent study done at Gujarat University, it was noticed from result of analysis question papers that weightage of marks distribution of different subdivision of pharmacology was not uniform per year wise although mean percentage has been reflecting adequate coverage of each subdivision.[6] In contrast, in our

Table 1: Frequencies and percentage of different systems of pharmacology in the question papers of individual examinations of second professional MBBS

Name of the system	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
General Pharma	2 (5)	3 (7.5)	2 (5.12)	2 (5.26)	4 (10.25)	4 (10.8)	3 (7.5)	4 (10)	3 (7.5)	4 (10)
ANS	4 (10)	4 (10)	4 (10.25)	5 (13.15)	6 (15.38)	6 (16.2)	4 (10)	6 (15)	9 (22.5)	3 (7.5)
CVS	5 (12.5)	5 (12.5)	5 (12.82)	5 (13.15)	4 (10.25)	4 (10.8)	4 (10)	5 (12.5)	5 (12.5)	6 (15)
CNS	7 (14.5)	7 (14.5)	7 (17.94)	7 (18.42)	4 (10.25)	5 (13.5)	6 (15)	6 (15)	6 (15)	6 (15)
Respiratory	3 (7.5)	3 (7.5)	3 (7.69)	2 (5.26)	2 (5.12)	2 (5.4)	3 (7.5)	2 (5)	1 (2.5)	2 (5)
GIT	2 (5)	2 (5)	1 (2.56)	2 (5.26)	1 (2.56)	2 (5.4)	3 (7.5)	3 (7.5)	2 (5)	4 (10)
Blood	4 (10)	2 (5)	2 (5.12)	2 (5.26)	2 (5.12)	3 (8.1)	2 (5)	2 (5)	2 (5)	1 (2.5)
Antimicrobials	8 (20)	6 (15)	8 (20.5)	8 (21.05)	10 (25.64)	821.6)	8 (20)	8 (20)	9 (22.5)	1 (2.5)
Endocrine	5 (12.5)	4 (10)	5 (12.82)	5 (13.15)	4 (10.25)	3 (8.1)	6 (15)	4 (10)	4 (10)	10 (25)
Autacoids	0	2 (5)	2 (5.12)	0	2 (5.12)	0	0	0	0	4 (10)
Misc	0	2 (5)	0	0	0	0	0	0	0	0

ANS: Autonomic nervous system, CVA: Cardiovascular systems, CNS: Central nervous system

Table 2: Frequencies and percentage of different systems of pharmacology in 20 sessions of examinations of second professional MBBS

System	Frequency (%)
General Pharma	31 (7.86)
ANS	51 (12.94)
CVS	48 (12.18)
CNS	61 (15.48)
Respiratory	23 (5.83)
GIT	22 (5.58)
Blood	22 (5.58)
Antimicrobials	83 (21.06)
Endocrine	44 (11.16)
Autacoids	6 (1.52)
Misc	3 (0.76)

ANS: Autonomic nervous system, CVA: Cardiovascular systems, CNS: Central nervous system

study, it was observed that weightage was uniform through the years but some topics such as NSAIDs, anticancer drugs, and immunosuppressants were consistently missing from the question paper. Allocation of weightage to various topics usually depends on two criteria: (1) the perceived impact/importance of a topic in terms of its impact on health, (2) the frequency of occurrence of a particular disease or the health problem.

Assessment has a powerful influence on the learning. Setting a balanced and good question paper is one of the critical activities to assess student's learning in cognitive domain. Scientific studies confirm that it is the evaluation system rather than the educational objectives, curriculum that has a profound impact on what the students ultimately learn.[7] Written examination is still the widely used test tool of evaluation which cannot be replaced entirely by any other method. Content validity correctly judges the knowledge and skills of the learner.

In the syllabus prescribed for undergraduate pharmacology by the university, contents of both papers have been defined. As of now, there are no clear-cut guidelines regarding the weightage to be given to various systems of pharmacology. Teachers select questions from various systems according to their own judgement. It is evident from question paper analysis that different systems of pharmacology are usually not given proper weightage in written examinations. In this study, it was observed that examiners give more importance to extensive systems such as CVS and CNS as compared to smaller ones such as blood and GIT, perhaps due to the absence of weightage for different subdivisions. Adequate coverage of course content is necessary for the validity of the assessment. It has been stated that weightage to the content areas is a delicate issue on which even experts often differ in opinion.[8]

Blueprinting is one way to link assessment to learning objectives. A proper blueprint is must in developing a valid examination. It specifies the objectives that are to be tested in the given examination as well as their relative weightage.[9] Content validity can also be established by drawing up a specifications grid which should identify the content areas, specify learning outcomes, determine the number of items for each content area and learning objective and ensure that the number of items in each cell is in proportion to the time spent in teaching and learning.[10]

Strengths and Limitations

This study is one of its kind to highlight need for assessment of pharmacology undergraduate written examinations in PT BDSUHS Rohtak. However, limitations of the study are that we have not compared the weightage given to various subdivisions with the number of teaching hours allotted to that particular subdivision. This is because of lack of guidelines from university regarding number of teaching hours to each topic.

CONCLUSION

In conclusion, it is important that while setting a paper, some topics include a few commonly prescribed drugs in clinical practice such as analgesics, diuretics, and antihistamines should be selected based on practical importance, and rare and unusual topics can be avoided to lessen students' burden of learning. Consistency can only be ensured in every question paper if there are set guidelines for marks distribution to the topics. Assessment should become an instrument for promoting growth rather than simply measuring it. It should not be used for merely classification, grading, and certification. Therefore, methods such as test blueprinting, and table of specifications should be used during test construction process to improve the assessment system.

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