



IMPACT OF RECENT EDUCATION REFORMS ON THE OUTCOMES OF STUDENT OF DIPLOMA IN PHARMACY IN PUNJAB

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ABSTRACT

Over the past two decade the role of pharmacist is evolved from that of compounder and dispenser of medicines to experts on medicines. The involvement of pharmacist has increased within multidisciplinary health care system. Keeping in view the evolving roles of Pharmacist PCI has introduced the new syllabus after a gap of 30 years for Diploma in Pharmacy. **Aim:** This study aims to assess the impact of recent education reforms and changes in curriculum of Diploma in Pharmacy on the outcomes of students in Punjab. **Methodology:** A literature search was conducted to find the recent reforms in pharmacy education and evaluation system. All the colleges of Punjab under Punjab State Board of Technical Education and Industrial Training (PSBTE & IT) were included in the study. The result of Diploma in Pharmacy under PSBTE & IT was available in open domain through PSBTE & IT website. **Result:** There are 105 colleges running course in Diploma in Pharmacy under the aegis of PSBTE & IT and PCI. In past year (academic year 2022-2023), PSBTE & IT has implemented various regulation reforms. The PCI has implemented new curriculum for Diploma in Pharmacy. This year 5477 students appeared for 2nd year examination of Diploma in Pharmacy and only 19.11% students passed in second year examination. There were 5 colleges in Punjab where the result was 100% and 20% colleges in Punjab where none of the students passed in Diploma in Pharmacy (2nd yr) examination. **Conclusion:** It can be concluded that regulation reforms implemented by PSBTE & IT has affected the examination system for Diploma in Pharmacy students and pass percentage of students have considerably decreased.

KEYWORDS :

INTRODUCTION

The origin of pharmacy education in India started in 1899 in Madras. Later undergraduate program in Pharmacy was started in under aegis of Prof M. L. Schroff in Benaras Hindu University in 1932. The statutory regulation of Pharmacy institutions in India was established with the enactment of the Pharmacy Act 1948. The Pharmacy Council of India was established in the year 1949 and the first Education Regulations (ER) framed in 1953, which were mended later in 1972, 1981, 1991 and 2020 for Diploma in Pharmacy.¹ Pharmacy education has a deep impact on the quality of health care offered to our population. Over the past two decade the role of pharmacist is evolved from that of compounder and dispenser of medicines to experts on medicines. The involvement of pharmacist has increased within multidisciplinary health care system. Pharmacists are not only involved in dispensing of medicines but are involved in clinical management, laboratory diagnostics.² Keeping in view the evolving roles of Pharmacist PCI has introduced the new syllabus after a gap of 30 years for Diploma in Pharmacy. PCI has implemented a new syllabus as per Education Regulation 2020 (ER 2020) for D. Pharmacy throughout India. The first batch with new syllabus of D. Pharmacy was graduated in 2023 (session 2021-23).³

Apart from PCI, Technical Boards from various states also regulate and monitor various diploma and Industrial Training Institutes (ITI) courses in respective state.⁴ From this year onwards PCI and Technical Boards have implemented various reforms in regulations and examination system. This study aims to assess the impact of recent education reforms and changes in curriculum of Diploma in Pharmacy on the outcomes of students in Punjab.

METHODOLOGY

A literature search was conducted to find the recent reforms in pharmacy education and evaluation system. The literature search was conducted using keywords- curriculum, Diploma in Pharmacy, education reforms, Syllabus, Pharmacy Council of India, Punjab, Private Pharmacy Colleges.

The changes in curriculum and governing body policies were searched. The result of first batch of D. Pharmacy students (final year) who have completed their Diploma with new curriculum was analyzed.

Sample:

All the colleges of Punjab under Punjab State Board of Technical Education and Industrial Training (PSBTE & IT) were included in the study. The result of Diploma in Pharmacy under PSBTE & IT was

available in open domain through PSBTE & IT website.

RESULTS

There are 105 colleges running course in Diploma in Pharmacy under the aegis of PSBTE & IT and PCI. The result of all Diploma in Pharmacy college is available in open domain from PSBTE & IT website.⁵ This year 5477 students appeared for 2nd year examination of Diploma in Pharmacy. In this academic session various reforms have introduced by PSBTE & IT for improvising the level of education which is being imparted to Diploma in Pharmacy students throughout Punjab. Also, the PCI has introduced changes curriculum for Diploma in Pharmacy. This paper will elaborate the changes introduced in Diploma in Pharmacy at various levels.

Regulation reforms

The literature search revealed that in Punjab, Vigilance Bureau (VB) has suspected anomalies in admission and conduct of examination in two-year diploma course in Pharmacy. Vigilance Bureau has sought record from PSBTE & IT for three years from 2019 onwards for Diploma in Pharmacy.⁶ Also, there are complaints of mass copying in D. Pharm Examination. There were colleges which reported to have dummy admissions where the colleges charge heavy fees of ₹1.5-2 lakhs per year rather than official fees of ₹30,000 stipulated by PSBTE & IT. There was news where PSBTE & IT has ordered several colleges to shutdown course under their flagship.⁷

In past year (academic year 2022-2023), PSBTE & IT has implemented various measures to overcome such issues such as:

- Monthly attendance of students in college by inspection team of various Government Polytechnic colleges
- Inspection team from different zones rather than from same nodal centre under which the college is located.
- All examinations were conducted in government colleges. None of the private college was allocated as examination centre.

Curriculum Changes

The syllabus for D. Pharm has been changed after almost 30 years. The focus of new syllabus is towards practice based knowledge enhancement.

The practice based subjects such as pharma cotherapeutics, social pharmacy and community pharmacy and management are included in new curriculum. Also, 275 tutorial hours, field visits and assignments are added to curriculum. The examination pattern is also changed. Instead of two long question of 16 marks each, there are 6 long questions for 5 marks each.

Table I enlists changes in syllabus for Diploma in Pharmacy and pattern of examination implemented by PCI in academic session 2021 onwards.³

Table I: Comparison of old and new curriculum.

	Old Curriculum	New Curriculum
Number of theory subjects	12	11
Number of Practical Subjects	9	10
Total theory teaching hours	850	825
Total practical hours	750	800
Number of Tutorial hours	-	275
Subjects merged from both years into single subject	Pharmaceutical Chemistry-I Pharmaceutical Chemistry-I Pharmaceutics-I Pharmaceutics-II	Pharmaceutical Chemistry-II Pharmaceutics-II
New Subject Added		Pharmacotherapeutics
New Practical Added		1. Community Pharmacy and Management 2. Social Pharmacy
Name of Subjects changed	1. Pharmacology and Toxicology 2. Pharmaceutical Jurisprudence 3. Drug Store and Business Management 4. Hospital and Clinical Pharmacy 5. Health Education and Community Pharmacy	1. Pharmacology 2. Pharmacy Law and Ethics 3. Community Pharmacy and Management 4. Hospital and Clinical Pharmacy 5. Social Pharmacy
Examination Scheme	Final Board Examination 80 marks and 20 marks internal assessment	
Final Board Examination	1. Long Question 2X16=32 2. Short Answers 8X4=32 3. Objective Answers 16X1=16	1. Long Question 6X5=30 2. Short Answers 10X3=30 3. Objective Answers 20X1=20
Internal Assessment	Theory	
	Sessional Examination Performance	Sessional Examination Performance
	Practical	
	<ul style="list-style-type: none"> Sessional Examination Performance Day to Day Practical performance 	<ul style="list-style-type: none"> Sessional Examination Performance Field Visits Assignments

Assessment of result of second year Diploma in Pharmacy students

The result of Diploma in Pharmacy (theory examination for second year) for the colleges under PSBTE & IT was evaluated. A total of 105 colleges offering the course in Diploma in Pharmacy fall under the flagship of PSBTE & IT.

Five thousand four hundred and seventy seven students appeared for second year Diploma in Pharmacy examination. Figure I show that the only 19.11% students passed in second year examination. Almost 10% students were absent in examination and 71.15% has reappear in one or more subjects.

Table II shows distribution of the pass percentage according to the colleges. It should be noted that there were 21% colleges in Punjab where none of the student passed in Diploma in Pharmacy (2nd yr) examination. There were 5 colleges in Punjab where the result was 100% out of which 4 were the Government polytechnic colleges. Fifty four percent colleges has result less than 10%.

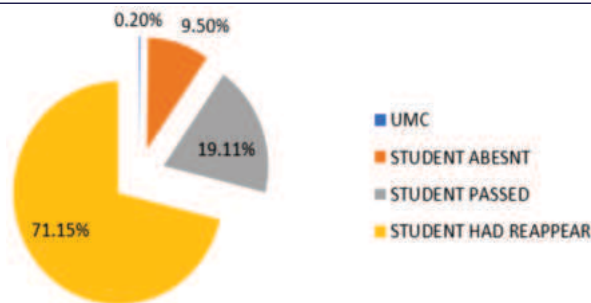


Figure I: Overall second year diploma result.

Table II: Distribution of colleges according to pass percentage.

Passing Percentage	Number of college	Percentage of college
0	22	21
1-5	24	23
6-9	11	10
10-19	10	9
20-29	7	7
30-39	3	3
40-49	4	4
50-59	2	2
60-69	6	6
70-79	2	2
80-89	3	3
90-99	6	6
100	5	5

Table III shows the subject wise result. Almost 60% of students had reappear in Pharmacology. It should be noted that highest pass percentage was in Community Pharmacy and Management, which is a new subject introduced in Pharmacy Curriculum (37%). Also, pass percentage was higher in Pharmacotherapeutics (32%) as compared to other conventional subjects. Both of these were new subjects introduced for the first time in Diploma in Pharmacy.

	Subject name	Total students	Absent*	Pass*	Reappear*
1	Pharmacology	5477	17.91	21.80	59.78
2	Community pharmacy & management	5477	22.44	36.92	36.19
3	Biochemistry & clinical pathology	5477	22.32	28.26	48.82
4	Pharmaco-therapeutics	5477	22.95	32.21	42.80
5	Hospital & clinical pharmacy	5477	22.82	32.76	42.72
6	Pharmacy law & ethics	5477	24.22	29.83	43.89

*Represented as Percentage

DISCUSSIONS

The PSBTE & IT has implemented various reforms to improve the education imparted in Diploma and ITI courses. The monthly attendance of students is verified by the inspection team to ensure that all the colleges have regular students and no dummy admissions are there. The change in examination centre from private to government colleges was done to overcome reports of mass copying in examination. All these reforms led to strict conduct of examination. Overall 9.5% students were absent from all theory examination. As compared to previous year where approx 100 % attendance was there in examination.⁸ It has been reported that from one college all 63 students skip examination as there were CCTV cameras in examination centre. None of the students passed in all theory examination in 22 out of 105 colleges. This indicates that reforms introduced by PSBTE & IT have significantly affected outcomes of Diploma in Pharmacy 2nd yr students.

The change in curriculum is more towards practice based pharmacy. The addition of tutorial hour is to encourage students to exchange their ideas with in small group where teacher can monitor individual student and provides with additional academic support. Further assignments are added for each subject which inculcate critical thinking, literature search, data interpretation and written communication among

students. Field visits play an important role in providing the students the real-world experience to the students. This will encourage practical exposure of the students. Field visits to manufacturing plant, healthcare centre, biomedical waste management plant and orphanage or old age homes, sensitize the students regarding various aspects of pharmacy. This explains the spread to pharmacist contribution to the society.

The results of students were higher in subjects such as pharmacotherapeutics and community pharmacy and management as compared to conventional subjects. This indicates performance of students in practice based students is more as compared to conventional students.

This study only include theory examination result of the second year for first batch of D. Pharmacy students passing out after implementation of new curriculum. The result of 1st year of same batch is not available in open domain. Moreover, the PSBTE & IT has implemented various education reforms from this academic session onwards. So the data for only this year is available. Performance of students in examination is only one of the indicators of effect of education reforms and curriculum change. Extensive research should be conducted to study parameters such as placement of student, interview performance and application of knowledge in practice.

To comprehensively evaluate a curriculum, educators should use data from a range of sources including assessment performance, graduate outcomes and workplace performance, and student perceptions.⁹⁻¹⁰ This is preliminary study and only focus on performance in final year examination. Overall the pass percentage D. Pharm 2nd yr student is reduced as compared to previous years. A similar study conducted by Ramasamy *et al* reported that implementation of outcome based learning in Electronics and Communication Engineering students initially lead to reduction in percentage of graduation but later it helped students to develop practical skills and become better entrepreneur¹¹. It is also expected that these changes introduced by PCI will help the students to prepare for the exit examination which is implemented from upcoming session. This will help them to serve their role as Pharmacist better in multidisciplinary health care system. This new curriculum is expected to prepare the D Pharm students to enter into the practice of pharmacy in times where enormous changes in healthcare and pharmacy profession has been witnessed specifically post-COVID era¹²⁻¹³. To improve the academic performance of students of D Pharm, the colleges should run mentorship programmes, embed use of technological support to improvise teaching, role plays should be included in class for better understanding¹⁴.

This study has various limitations. It only includes one aspect of curriculum evaluation which is examination outcome. The author agrees that this curriculum change is also expected to affect various other aspects of pharmacy education such as interview performance, performance in exit examination (when implemented), pharmacy store management skills. This is a preliminary student which only include data from one year. But as subsequent batches will pass, the data will be collected over the next few years and will be compared

CONCLUSION

It can be concluded that regulation reforms implemented by PSBTE& IT has definitely affected the examination system for Diploma in Pharmacy students. The pass percentage of students is decreased as compared to previous year. The changes in curriculum implemented by PCI have brought a shift from class room learning to practice based learning. It is expected that this will improve the skills of pharmacist to take up various roles in multidisciplinary health care system.

Abbreviation: Pci:

Pharmacy council of India, **PSBTE&IT:** Punjab state board of technical education and industrial training, **ITI:** Industrial Training Institutes

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Summary: Over the past two decade the role of pharmacist is evolved from that of compounder and dispenser of medicines to experts on medicines. The involvement of pharmacist has increased within multidisciplinary health care system. Keeping in view the evolving

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