Research Article

A prescription Audit of outpatient departments in a Medical College involving Phase 2 Medical Undergraduate Students: An Observational Study

Aditi Chaturvedi*, Maninder Singh, Munish Kumar

Department of Pharmacology, Professor, Pt.Jawaharlal Nehru Govt. Medical College, Chamba, HP. India

(Received: 12-09-2025 Revised: 18-09-2025 Accepted: 24-12-2025)

Corresponding Author: ***Aditi Chaturvedi*** Email: aditichaturvedi1978@gmail.com

ABSTRACT

Introduction and Aim: Medical audit is a continuous systematic evaluation of clinical practices and medical care quality intended at identifying errors, improving patient care and optimizing medical resource utilization. Prescription audit, a key component of medical audit, objectively assesses prescribing patterns of clinicians against established standards. Its benefits include rational drug use, improved prescribing behavior, efficient resource allocation, and enhanced patient outcomes. However, it is not routinely done due to lack of expert dedicated manpower for this work in medical colleges in India.

Material and Methods: This study explored, the involvement of medical undergraduate students to support prescription auditing in a medical college. The study involved, evaluation of outpatient prescription compliance using the National Accreditation Board for Hospitals and Healthcare Providers (NABH) checklist, audited by undergraduate medical students.

A retrospective observational study was conducted using prescriptions reviewed by Phase 2 MBBS students during the 2020-2021 academic session. In accordance with the competency-based medical curriculum of the National Medical Commission (NMC), students undertook prescription appraisal (PH3.2 competency) as part of pharmacology practical training. Following structured instruction, out patient prescriptions were audited by medical students using the NABH checklist which were reassessed by faculty investigators from the Department of Pharmacology. The results were represented in percentages and used chi square tests for the comparison of the students and investigators NABH prescription audit parameters. Additionally, the faculty investigators also examined WHO prescribing indicators, prescription legibility, and polypharmacy.

Results: Of the 120 prescriptions submitted, 32 were duplicates and 19 were excluded for errors such as inpatient charts or prescriptions from external institutions. Thus, 51 (42.5%) were eliminated. To preserve sample size, additional valid outpatient prescriptions audited by students were included, maintaining sample size to 120 for final analysis. Overall, students' reporting was comparable to investigators in most parameters. Polypharmacy was evident in 73.3% of prescriptions. Sixteen percent of prescriptions were illegible. Of the 394 prescribed drugs, 56.3% were generic. Antibiotics accounted for 12.2% (48 drugs), while 61.7% of the prescriptions were from the Essential Drugs List (EDL).

Conclusion: The findings demonstrate that undergraduate medical students can effectively participate in prescription auditing under appropriate faculty supervision with emphasis on observing duplication and errors in reporting.

Keywords: Prescription audit, NABH, NMC, medical education

1. Introduction

Medical audit refers to the systematic review of clinical practices to enhance patient care and ensure rational use of medical resources [1, 2]. Prescription audit is a subset of medical audit, that provides an unbiased assessment of whether prescribing practices align with established standards and aims to improve rational prescribing, improved prescription practices, optimal resource allocation, and enhanced patient outcomes [3, 4, 5]. Despite these advantages, prescription auditing is often neglected due to a lack of trained personnel, specifically dedicated for this work in most medical colleges in India, limiting opportunities to improve patient care quality. The National

Medical Commission (NMC) of India mandates Phase 2 medical undergraduate students to acquire the competency of critically appraising prescriptions (PH3.2). Undergraduate medical students could thus support Pharmacology department in auditing prescriptions, promoting rational drug use, and standardizing prescribing practices. Against this background, this study aimed to evaluate outpatient prescriptions audited by medical undergraduates and identify errors in their reporting.

Aim

To evaluate outpatient prescriptions audited and submitted by undergraduate medical students to the Department of Pharmacology.

Research Question

Can Phase 2 undergraduate students be effectively involved in prescription auditing in medical colleges?

Objectives

Primary Objective

To evaluate compliance and non-compliance with the NABH prescription audit checklist in outpatient prescriptions reviewed by medical undergraduates.

Secondary Objectives

1. To assess WHO prescribing indicators.
2. To evaluate overall legibility of prescriptions and assign grades.
3. To analyze the incidence of polypharmacy.
4. To identify common errors in outpatient prescription writing.

2. Materials and Methods

Study Design and Methodology

A retrospective observational study was conducted on prescriptions audited by Phase 2 undergraduate students during 2020–2021. Under the competency-based medical curriculum, students were required to critically appraise prescriptions (PH3.2) as part of routine practical training [6]. Following a teaching session, students were instructed to audit two outpatient prescriptions each, using the NABH 13-item checklist and assign scores out of 13 [7]. From these, 120 prescriptions audited by students were randomly selected for further evaluation. Based on the National Health Mission sample size calculator, 94-96 prescription audits were required for outpatient attendance of 3000–10,000 per day, with a 95% confidence interval and 10% margin of error [8]. As institutional outpatient attendance ranged between 2000–3000 daily, 120 prescriptions were deemed adequate.

The faculty investigators from the Department of Pharmacology re-evaluated student audited prescriptions to determine compliance with the NABH checklist. Additionally, they also examined WHO prescribing indicators, prescription legibility, and polypharmacy. Errors made by students in audit reporting were rectified, and final reports were prepared. Problems identified in prescription writing were documented, and corrective measures were planned. Evaluation was conducted using WHO core prescribing indicators: (a) average number of drugs per prescription, with fixed-dose combinations considered as one drug; (b) percentage of drugs prescribed by generic name;(c) percentage of antibiotics per prescription; (d) percentage of injections per prescription, excluding vaccinations; and (e) percentage of drugs prescribed from the Essential Drugs List. Prescription legibility was assessed independently by two investigators on a subjective three-grade scale: Grade 1 (easily legible), Grade 2 (legible with difficulty), and Grade 3 (illegible). In cases of disagreement, a third evaluator's opinion was obtained. Polypharmacy was classified as: no polypharmacy (<2 drugs), minor polypharmacy (2-4 drugs), and major polypharmacy (≥5 drugs).A total of 120 prescriptions submitted by students during 2020–2021 were evaluated. Inclusion criteria comprised all outpatient prescriptions audited by Phase 2 medical students during this period. Repetitions were carefully identified and excluded from the final analysis.This systematic evaluation provided insights into prescribing patterns, adherence to essential drug recommendations, and legibility, offering scope for assessing prescribing quality and identifying areas for improvement.

Statistical Methods: The results were represented in percentages and using chi square tests for the comparison of the students and investigators

NABH prescription audit parameters.

3. Results

A total of 32 out of 120 prescriptions were repeat prescriptions and were excluded from the study. Additionally, 19 prescriptions were not audited as they included IPD drug charts or OPD prescriptions from other institutes. Overall, 42.5% of prescriptions were removed from auditing. To maintain the sample size, more OPD prescriptions audited by medical students from the institute were included, resulting in 120 prescriptions audited by investigators.

Table 1: Comparison of Prescription Audit Checklist as per NABH guidelines by medical undergraduates and investigators and identification of errors of medical undergraduates in prescription auditing.

Prescription audit checklist NABH guidelines	Prescription audit by medical undergraduate student (120)			Prescription audit by investigators (120)			Errors identified by investigators	Chai Square Test
	Yes	No	NA	Yes	No	NA		
Name of patient	120	0		120	0		0	--
Age	120	0		120	0		0	--
OPD number	120	0		107	13		13	0.0002
Dose of drug	85	35		90	30		10	0.4676
Dosage of drug	114	06		116	04		04	0.5182
Route of drug	95	25		105	15		20	0.0832
Frequency/time of administration	106	14		102	18		08	0.4475
Date	110	10		112	08		02	0.6240
Legible	96	24		103	17		14	0.2299
Known allergy documented	00	120		00	120		00	--
Uniform location of treatment	106	14		112	08		12	0.1795
Non-standard abbreviation used	04	116		06	114		04	0.5182
Presence of therapeutic duplication	00	120		00	120			--
Drug interaction, if any	00	00	120	00	00	120	00	--
Food drug interaction any	00	00	120	00	00	120	00	--
Signature of doctor	94	26		96	24		04	0.7505
Average Score allotted	10.7			10.8				--
Total counts	1279	161	480	1297	143	480	99	0.2750
Percentage of total count	66.6%	8.2%	25%	67.5%	7.5%	25%	5.1%	--

Table1 presents a comparison of the NABH prescription audit checklist assessed by undergraduate medical students versus investigators. Most parameters showed no significant difference between the two groups. However, discrepancies were noted regarding the OPD number: investigators reported 13 prescriptions lacking OPD numbers, whereas students had recorded all prescriptions as containing them. Assessments of drug administration routes and prescription legibility showed no significant differences. Similarly, the average and total counts reported by students and investigators were comparable.

Table 2: Prescription auditing by investigators based on WHO core prescribing indicators.

WHO core prescribing indicators	**Total number of drugs**	**Average/percentage per prescription (n=120)**
Drugs per prescription	394	3.28
Drugs prescribed by generic name	222 (56.3% of the drugs were generic)	1.85
Antibiotics	48	0.4
FDC	52	0.4
Injection excluding vaccine	170	1.4
Drugs from EDL	243	2.0

Table 2 highlights WHO core prescribing indicators assessed by investigators. Of the 394 prescribed drugs, 56.3% were generic. Antibiotics accounted for 12.2% (48 drugs), while 61.7% of the prescriptions were from the Essential Drugs List (EDL).

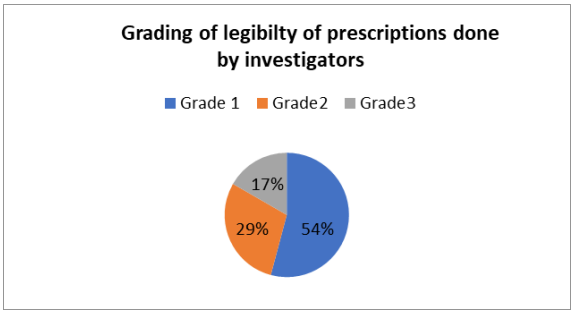

Figure1:- Distribution of prescription legibility grades assessed by investigators(Grade 1: easily legible, Grade 2: Legible with difficulty, Grade 3: Illegible)

Figure 1 depicts prescription legibility graded by two independent investigators. Overall, 16.7% of prescriptions were labelled illegible. The distribution of grades revealed that 54% were clearly legible (Grade 1), 29% moderately legible (Grade 2), and 17% poorly legible (Grade 3). Thus, while over half of prescriptions demonstrated acceptable legibility, 46% were at risk for misinterpretation, potentially increasing the likelihood of medication errors and compromising patient safety.

Table 3 shows the evaluation of other prescription parameters by investigators. Notably, none of the prescriptions included the doctor's registration number. Directions for drug use were absent in 15% of prescriptions. Furthermore, 87.5% lacked the doctor's name or department, 97.5% did not record patient weight,

and 89.2% failed to include follow-up advice.

Table 3: Assessment of other parameters in prescription auditing by investigators

Other parameters that were assessed in the prescriptions by the investigators	**Yes(out of 120)**	**NO(out of 120)**
Doctor registration number	0	120
Complete diagnosis written	65	55
Direction for use of drugs	102	18
Follow up advice written	13	107
Correct Dose	110	10
Doctor name department mentioned	15	105
Patients weight written	03	117

Polypharmacy was evident in 73.3% of prescriptions: 50% displayed minor polypharmacy (2–4 drugs), while 23.3% showed major polypharmacy (≥5 drugs).These findings indicate that while undergraduate students' audits aligned well with investigators on several checklist items, certain critical discrepancies—such as omission of OPD numbers identification—were identified.

Tabel 4: Significant Problems Identified and Action Plan

Problems Identified	**Action Plan**
Student-related issues: duplication of prescriptions, use of IPD or outside-institute prescriptions.	Faculty to cross-verify all prescriptions submitted by students before auditing.
Only 56.3% of drugs prescribed by generic name.	Conduct structured discussions with clinicians to identify barriers; reinforce the importance of generic prescribing.
16.7% prescriptions poorly legible (Grade 3).	Provide regular reminders to clinicians for legible writing and minimizing polypharmacy.
Only 15/120 prescriptions mentioned doctor's name and department.	Encourage use of stamps with doctor's name and department on all OPD prescriptions.
No prescription recorded doctor's registration number or patient drug allergy status.	Emphasize inclusion of doctor's registration number and allergy status on every prescription.
Patient weight recorded in only 3/120 prescriptions.	Remind clinicians to document patient weight wherever relevant, especially in pediatric and dose-dependent prescriptions.

The WHO prescribing indicators suggest moderate adherence to rational prescribing practices, with scope for improvement in generic prescribing from the essential drug list. Prescription legibility, although acceptable in most cases, remains an area requiring attention to reduce risks of misinterpretation. Additionally, significant deficiencies in documentation, particularly regarding physician details, patient weight, and follow-up instructions, highlight the need for stricter compliance with standard prescribing protocols. Table 4 shows the list of significant problems identified and action plan for improving prescription writing in the Institution.

Additional Institutional Measures

Additional Institutional measures as mentioned below were planned further for improving the prescription audit practices in the Institute.

- Develop a standardized Google form incorporating NABH parameters and WHO prescribing indicators. Students will upload audited prescriptions, which will be verified by faculty, ensuring accuracy.
- The Google form will allow yearly audits and facilitate trend analysis for continuous monitoring and improvement.
- The next audit will compare findings with the current cycle to evaluate progress.
- The audit report will be submitted to the Prescription Audit Committee, Heads of Departments, and clinicians for corrective action.

Further, systematic implementation of these measures will enhance rational prescribing, improve documentation standards, and promote patient safety. Regular audits using standardized tools will institutionalize prescription auditing as an integral academic and clinical activity.

4. Discussion

Regular prescription audits in medical colleges are challenging due to limited faculty and high workload. This study evaluated the role of Phase-2 undergraduate medical students involvement using the NABH checklist of prescription auditing so that prescription auditing could become a routine practice in medical colleges and thus contribute to improving quality of medical care offered on a continuous basis.

Feasibility of Student Involvement

Overall, students' prescription audit reporting was comparable to investigators in most parameters, including patient name, age, dosage, frequency, treatment order, and doctor signature. The exception was OPD number reporting, where students significantly misidentified 13/120 prescriptions (p=0.0002). Reinforcing training on locating OPD numbers could minimize such discrepancies. Students slightly

under-reported dose (85 vs 90) dosage (114 vs 116), route of drug administration (95 vs 105), date (110 vs 112), signature of doctor (94 vs 96), legibility (96 vs 103) and over-reported frequency of drug administration (106 vs 102). This conveys that further emphasizing for better understanding of identification of frequency, dose, dosage, route of drug administration, date and signatures in prescriptions were needed. Students underreporting of legibility could also be due to lack of knowledge/familiarity about drug names and hence reporting it as illegible.

Approximately 26.6% of prescriptions were repeats, and 15.8% were IPD or from other institutes, indicating potential casual duplication or misclassification by students. Faculty oversight is thus essential. Integration of software to flag duplicates, identify OPD/IPD prescriptions, and guide auditing could further improve accuracy. The Department of Pharmacology has now implemented Google Forms incorporating NABH and WHO parameters, allowing faculty review and validation after the completion of this study.

Advantages of Student Involvement

- Availability of large, skilled and educated workforce for prescription auditing.
- Annual audits enable monitoring of prescription trends and quality improvement.
- Encourages future doctors to internalize rational prescribing practices.
- Efficient and quick auditing: 100 students can review 200–300 prescriptions in 30 minutes.
- Promotes unbiased assessment.
- Hands-on training for competency PH 3.2 while supporting institutional needs.

Limitations

- Risk of casual duplication or copying.
- Beginner-level errors in parameter identification (e.g., OPD numbers).
- Faculty workload may increase due to cross-checking.
- Possible resistance from senior clinicians.
- Subjective variability in legibility assessment.

Structured training and preliminary tests are recommended before students participate in prescription audits. Discrepancy between student and faculty reporting was 5.1%, lower than 18% reported elsewhere by Shikha et al where students also audited complex WHO prescribing indicators. Simpler NABH parameters and smaller sample size (120 vs. 700) likely explain reduced discrepancy in our study. Shikha et al. reported that students had difficulties differentiating brand/generic drugs, fixed-dose combinations, and investigations, justifying lower discrepancy (5.1%) in our study as students did not audit complex WHO parameters [9].

Prescription Documentation

Patient weight, doctor details, follow-up, and allergy status: Only 2.5% of prescriptions included weight, consistent with 8.7–17% reported previously [1, 10]. Twenty percent lacked doctor signatures, and only 12.5% included doctor name/department. Absence of doctor details may invalidate prescriptions, especially for restricted drugs. Registration numbers of doctors and allergy status were missing in all prescriptions, aligning with prior studies [10-12]. Follow-up advice was recorded in only 10.8%. Lack of allergy documentation increases the risk of adverse drug reactions, highlighting a need for clinician sensitization. There appeared a need for improvement in mentioning the department name and unit in our setup.

Legibility: Sixteen percent of prescriptions were illegible, consistent with other reports where poor hand writing was linked to dispensing errors [13]. Indian regulations now recommend capital letters or electronic prescriptions to reduce such errors [10, 14].

Generic vs. branded drugs and antibiotics

Fifty-six percent of drugs were prescribed by generic names, promoting affordability and minimizing confusion from similar-sounding brands. Antibiotic use was low (12.2%), comparable to Prasad et al. (9.6%) and below many other studies (17–53.6%), suggesting judicious prescribing in line with WHO recommendations (20–25.4%) [15-18].

Essential drug list (EDL) and polypharmacy

Sixty-one percent of medicines were from the EDL, lower than 79.2% in other study [10]. The average of 3.28 drugs per prescription exceeded

WHO standards (1.6–1.8), indicating polypharmacy and potential irrational prescribing [9].

Injectables: Injectables comprised 43.1% of prescriptions, exceeding WHO standards (13.4–24.1%) and a lot of other studies [1, 9, 10]. This could likely be explained as a reflection of rural patient demographics in the area presenting late with acute conditions and therefore need for inclusion of emergency OPD prescriptions with injectables.

Implications for Practice: Undergraduate involvement can strengthen prescription monitoring if adequately supervised. Faculty should emphasize complete documentation-patient weight, allergy status, doctor identification, follow-up advice-to enhance prescription quality. Technological support, such as student-friendly software, can streamline auditing, reduce errors, and minimize faculty workload.

5. Conclusion

Phase-2 undergraduate students represent a valuable resource for conducting NABH-based prescription audits for OPD prescriptions, provided faculty vigilance ensures prevention of duplication and accurate OPD/IPD classification. The audit revealed areas needing improvement: documenting patient details, doctor identification, allergy status, and rational prescribing. Combining student involvement with training, faculty oversight, and technological support may enhance prescription audit efficiency and quality of medical care offered to patients.

Acknowledgement

We gratefully acknowledge the valuable contributions of the 2nd Professional MBBS students in conducting the prescription audit. Their active participation and diligent efforts were instrumental to the successful completion of this study.

Conflict of Interest statement & Declaration

The authors declare that no conflict of interest and no funds, grants, or other support were received during the preparation of this manuscript.

Ethical Information

Authors have obtained ethical clearance from the Institute by the Institutional Ethics Committee with reference no: IEC/2023/Sept/34(a) dated, 25th September 2023.

REFERENCES

1. Bandyopadhyay D, Banerjee CN, Chattopadhyay S, Singha P. A study of prescription auditing in a tertiary care teaching hospital of Eastern India. *J Drug Deliv Ther*. 2014;4(1):140-9.
2. Hopkins A. Clinical audit: time for a reappraisal. *Journal of the Royal College of Physicians of London.* 1996 Sep;30(5):415.
3. Sellu D. Time to audit audit. *BMJ*. 1996 Jan 13;312(7023):128-9.
4. Robinson S. Evaluating the progress of clinical audit: A research and development project. *Evaluation.* 1996 Oct;2(4):373-92.
5. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. *American journal of hospital pharmacy*. 1990 Mar 1;47(3):533-43.
6. NMC Website: https://www.nmc.org.in/information-desk/for-colleges/ug-curriculum/
7. Solanki ND, Shah C. Prescription audit in outpatient department of multispecialty hospital in western India: An observational study. *Int J Clin Trials.* 2015 Jan;2(1):14-9.
8. Prescription Audit Guidelines. National Health Mission. Government of India. Chrome extension://efaidnbmnnnibpcajpcglclefindmkaj/https://nhsrcindia.org/sites/default/files/2021-07/1534_Prescription%20Audit%20Guidelines16042021.pdf.
9. Shikha Dwivedi, Ayush Jain, Annwesha Chaudhury, Sanjay Gaur, Libin Sanjeev L, "Prescription audit as a teaching tool under cbme curriculum in a government medical college", *IJMSIR*- December - 2022, Vol – 7, Issue - 6, P. No. 130 – 135.

10. Ahsan M, Shaifali I, Mallick AK, Singh HK, Verma S, Shekhar A. Prescription auditing based on World Health Organization (WHO) prescribing indicators in a teaching hospital in North India. *Int J Med Res Rev.* 2016;4(10):1847-52.
11. Abidi A, Gupta S, Kansal S, Ramgopal R. Prescription auditing and drug utilization pattern in a tertiary care teaching hospital of western UP. *Int J Basic Clin Pharmacol.* 2012 Dec;1(3):184-90.
12. Seden K, Kirkham JJ, Kennedy T, Lloyd M, James S, Mcmanus A, Ritchings A, Simpson J, Thornton D, Gill A, Coleman C. Cross-sectional study of prescribing errors in patients admitted to nine hospitals across North West England. *BMJ open.* 2013 Jan 1;3(1):e002036.
13. Kiekkas P, Karga M, Lemonidou C, Aretha D, Karanikolas M. Medication errors in critically ill adults: a review of direct observation evidence. *American Journal of Critical Care.* 2011 Jan 1;20(1):36-44.
14. Albarrak AI, Al Rashidi EA, Fatani RK, Al Ageel SI, Mohammed R. Assessment of legibility and completeness of handwritten and electronic prescriptions. *Saudi Pharmaceutical Journal.* 2014 Dec 1;22(6):522-7.
15. Prasad PS, Rudra JT, Vasanthi P, Sushitha U, Sadiq MJ, Narayana G. Assessment of drug use pattern using World Health Organization core drug use indicators at Secondary Care Referral Hospital of South India. *CHRISMED Journal of Health and Research.* 2015 Jul 1;2(3):223-8.
16. Abidi A, Gupta S, Kansal S, Ramgopal R. Prescription auditing and drug utilization pattern in a tertiary care teaching hospital of western UP. *Int J Basic Clin Pharmacol.* 2012 Dec;1(3):184-90.
17. Potharaju HR, Kabra SG. Prescription audit of outpatient attendees of secondary level government hospitals in Maharashtra. *Indian journal of Pharmacology.* 2011 Mar 1;43(2):150-6.
18. Prasad PS, Rudra JT, Vasanthi P, Sushitha U, Sadiq MJ, Narayana G. Assessment of drug use pattern using World Health Organization core drug use indicators at Secondary Care Referral Hospital of South India. *CHRISMED Journal of Health and Research.* 2015 Jul 1;2(3):223-8.