(RESEARCH ARTICLE)

# Assessment of prescription writing skills among second phase MBBS undergraduate students of tertiary care teaching hospital in north India

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## Abstract

**Background**: Prescription writing requires training as a part of the undergraduate teaching programme. Training impacts irrational prescribing of drugs and combats overuse and their adverse effects. This study carried out at Government medical college Jammu in the department of pharmacology, assessed prescription writing skills in the second phase of undergraduate MBBS students of tertiary care teaching hospital in North India

**Method**: After taking approval from the Institutional ethics committee, this cross-sectional, study was conducted which involved 175 students .After introducing prescription errors and systemic methods of prescription writing (by WHO),each participant was subjected to a clinical case scenario.

**Result**: This study delves into the prescription writing skills of 175 second-phase MBBS undergraduate students at a tertiary care teaching hospital in North India. The assessment identifies strengths and areas for improvement, shedding light on critical aspects of medication prescribing and its implications for patient safety. Noteworthy strengths include a clear understanding of dosage calculations, accurate prescription formatting, and effective communication of treatment plans. However, challenges lie in minor inconsistencies in drug interactions, the need for improvement in generic drug usage, and issues related to writing legible prescriptions.

The evaluation extends beyond prescription writing to encompass broader skills crucial for medical practitioners. While students exhibit proficiency in systemic pattern knowledge, areas such as communication, problem-solving, and professionalism require targeted interventions. The assessment of overall skills emphasizes the interconnected nature of competencies necessary for delivering comprehensive and patient-centered care.

Furthermore, the study explores the potential impact of enhancing prescription writing skills on healthcare benefits. The majority of students demonstrate excellence in writing accuracy, clinical documentation proficiency, communication clarity, and healthcare records precision. These findings underscore the significance of continuous skill development to ensure safe and effective healthcare delivery.

**Conclusion**: In conclusion, the insights derived from this research provide a foundation for tailored interventions and strategies to enhance prescription writing skills among medical students. The study advocates for ongoing efforts in medical education, fostering a culture of continuous learning and improvement. The results contribute to the broader discourse on medical education and underscore the imperative of preparing future healthcare professionals for the complexities of prescription writing in diverse healthcare settings.

**Keywords:** Undergraduate teaching programme; Prescription errors; Prescription writing; Prescription methods

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## 1. Introduction

In the realm of medical education, the acquisition and mastery of prescription writing skills are paramount for the development of competent and responsible healthcare professionals. The second phase of the MBBS curriculum represents a crucial juncture in medical education, where students transition from foundational knowledge to more specialized clinical skills. As part of this transformative phase, the assessment of prescription writing skills among second-phase MBBS undergraduate students emerges as a critical endeavor, with implications for the quality of patient care and the overall effectiveness of medical training.

The significance of prescription writing cannot be overstated, as it serves as a fundamental tool through which healthcare providers communicate treatment plans to patients and collaborate with other members of the healthcare team. The ability to construct clear, accurate, and safe prescriptions is indicative of a student's comprehension of drug interactions, dosage calculations, and adherence to ethical standards. Moreover, effective prescription writing is intrinsically linked to patient safety, making it a cornerstone of responsible medical practice (Smith et al., 2018).

The focus on second-phase MBBS students in this assessment is intentional, recognizing that this stage of medical education marks the transition to more intensive clinical exposure. As students embark on clinical rotations and engage with real patient scenarios, the practical application of prescription writing skills becomes imperative. Assessing these skills at this juncture provides insights into the students' assimilation of theoretical knowledge into clinical practice and helps identify areas for targeted intervention and improvement.

This assessment is situated within the context of a tertiary care teaching hospital in India, reflecting the unique challenges and opportunities associated with the Indian healthcare system. Tertiary care hospitals are pivotal in providing advanced medical services, and students' ability to navigate prescription writing within this setting is indicative of their preparedness for the complexities of healthcare delivery in the real world (World Health Organization, 2020).

In order to conduct a comprehensive evaluation, a mix of quantitative and qualitative research methods will be employed. Surveys and written assessments will capture quantitative data on students' prescription writing skills, while qualitative interviews and focus group discussions will provide deeper insights into the factors influencing these skills. By employing a mixed-methods approach, the study aims to offer a nuanced understanding of the challenges and strengths of prescription writing among second-phase MBBS students in the specified tertiary care teaching hospital.

This assessment holds great promise for enhancing medical education and patient care in India by pinpointing specific areas for curriculum refinement and educational interventions. Ultimately, the findings from this study have the potential to contribute to the broader discourse on medical education and prescription writing skills, with implications for the continuous improvement of healthcare delivery worldwide.

Prescription abbreviated as (Rx) comes from Latin (take thou). Prescription may be handwritten. Prescription may be entered into electronic medical record and transmitted electronically to a pharmacy. Prescription may also be transmitted from physician to pharmacist orally by telephone.

Earlier prescription writing was done in Latin as standard language which is no longer used now. The symbol Rx is recorded in 16th century manuscripts as an abbreviation of late Latin instruction, meaning receive. Medieval prescriptions invariably began with instructions from physicians to apothecary to take certain medications and compound them in specific way.

Modern prescriptions are written on the spot for a specific patient with a specific ailment by a registered clinical practitioner and is composed of four parts which is superscription, inscription, subscription and signature. (Ajay Kumar et al;2019)

Medical undergraduate students will have a strong knowledge of the therapeutic principles as well as the actions of drugs which will be beneficial in giving quality of health to patients and bring future developments in the health care systems. (maxwell A2012)

Periodic assessments of the students are essential to assess their knowledge on prescription writing skills and six step prescription writing model of WHO needs to be followed precisely for training students (suhaina AS et al;2021)

Parameters included in prescription writing according to WHO. The patient's demographic details like name, age, weight and address. The date on which the prescription was given. Doctor details like name of the prescribing doctor, with his/her qualifications, medical council registration number, address, signature and phone number.

Drug details like a) use of generic /brand name of a drug prescribed. B) number of drugs used in prescription .c) frequency, dosage and strength in mg/ml/gm according to age and weight, number of dosages, units, quantity and amount to be administered. E) Duration of medicine to be taken. F) route of drug administration G) refilling of drug prescribed. H) Follow up and other specific instructions.

Using of superscription in a prescription of Rx. Mentioning the diagnosis for which medicine is prescribed, with any drug related allergies.

## 2. Literature review

The assessment of prescription writing skills among medical students has been a subject of increasing importance in the literature, recognizing the pivotal role that effective prescription writing plays in patient safety and the overall quality of healthcare delivery. A study by Smith et al. (2018) conducted in an Australian hospital evaluated the quality of prescription writing by junior doctors, highlighting the need for ongoing scrutiny and improvement in this critical aspect of medical practice. The findings underscored the significance of clear, accurate, and unambiguous prescriptions in minimizing medication errors and enhancing patient outcomes.

As medical education evolves, the emphasis on prescription writing skills becomes particularly pronounced during the second phase of the MBBS curriculum. This phase represents a crucial transition from theoretical knowledge to practical application, with students engaging in clinical rotations and direct patient care. A study by Al-Dabbagh et al. (2019) emphasized the importance of integrating prescription writing assessments into medical education, especially during the clinical phases, to ensure that students are adequately prepared for the complexities of real-world healthcare scenarios. The study identified a need for targeted interventions to address deficiencies in prescription writing skills and suggested that early assessment during undergraduate education can contribute to improved competencies among future healthcare practitioners.

In the context of the Indian healthcare system, where unique challenges and opportunities abound, the assessment of prescription writing skills gains additional significance. Tertiary care teaching hospitals serve as crucibles for medical training in India, exposing students to a diverse range of clinical conditions and patient populations. The World Health Organization (2020) emphasizes the importance of interprofessional education and collaborative practice in healthcare settings, recognizing that effective communication, including through prescription writing, is essential for delivering quality care. This global perspective underscores the relevance of assessing prescription writing skills among second-phase MBBS students in the specific context of a tertiary care teaching hospital in India.

While existing literature provides valuable insights into prescription writing assessments and their importance in medical education, there is a notable gap concerning the specific challenges and strengths observed among second-phase MBBS students in the Indian context. This current study aims to address this gap by employing a mixed-methods approach, combining quantitative assessments with qualitative interviews and focus group discussions. Such an approach allows for a comprehensive exploration of prescription writing skills, considering both the quantitative metrics and the underlying factors that influence these skills among students in the specified tertiary care teaching hospital.

In summary, the existing literature underscores the critical nature of prescription writing skills in medical practice, particularly during the formative years of undergraduate medical education. The synthesis of insights from international studies and the global emphasis on interprofessional education provides a foundation for understanding the broader implications of prescription writing skills assessment. This study seeks to contribute to this body of knowledge by offering a context-specific exploration of second-phase MBBS students in an Indian tertiary care teaching hospital, thereby enriching the discourse on medical education and healthcare quality improvement.

*Aim/objective*

- Prescription writing skills assessment in second phase MBBS undergraduate students.
- To evaluate student's skills to improve systemic patterns prescribed
- Improve and increase healthcare benefits by reducing the level of errors in writing by undergraduates.

## 3. Materials and Methods

**Inclusion criteria:** All students of second phase MBBS in GMC Jammu

**Exclusion criteria:** First phase, third phase, pre final and final phase students. Students not willing to participate.

### 3.1. Method

After taking approval from the institutional ethical committee, this cross- sectional study was conducted. A total number of 175 students participated in the study. A clinical case scenario was given to each one of them after demonstrating them the prescription errors and systemic methods of prescription writing according to WHO. Data was thoroughly assessed to check for the patient details, doctor details, diagnosis of disease, history of allergies, drug generic names, dosage, route, duration, refilling and follow-up, doctor signature, date of prescription and data was calculated on percentage basis.

## 4. Results

### 4.1. Prescription writing skills assessment in second phase MBBS undergraduate students

**Table 1** Strengths in Prescription Writing Skills

|  | No. of second phase MBBS Undergraduate students | Percentage |
|---|---|---|
| Clear understanding of dosage calculations | 100 | 57.14 |
| Accurate prescription format | 49 | 28.01 |
| Excellent communication of treatment plans | 26 | 14.85 |
| Total | 175 | 100.0 |

**Table 2** Areas for Improvement in Prescription Writing Skills

|  | No. of second phase MBBS Undergraduate students | Percentage |
|---|---|---|
| Minor inconsistencies in drug interactions | 85 | 48.57 |
| Need improvement in generic drug usage | 55 | 31.43 |
| Challenges in writing legible prescription | 35 | 20.0 |
| Total | 175 | 100.0 |

### 4.2. Evaluate student's skills to improve systemic patterns prescribed

**Table 3** Areas for Improvement in Prescription Writing Skills

|  | Excellent/ Good (%) | Satisfactory (%) | Needs Improvement (%) |
|---|---|---|---|
| Clinical Skills | 65% | 25% | 10% |
| Communication Skills | 59% | 30% | 11% |
| Problem-Solving Abilities | 67% | 17% | 16% |
| Professionalism | 55% | 28% | 17% |
| Systemic Pattern Knowledge | 71% | 24% | 5% |

## 4.3. Improve and increase healthcare benefits by reducing the level of errors in writing by undergraduates.

**Table 4** Improve and increase healthcare benefits by reducing the level of errors in writing by undergraduates

|  | Excellent/ Good (%) | Satisfactory (%) | Needs Improvement (%) |
|---|---|---|---|
| Writing Accuracy | 68% | 23% | 9% |
| Clinical Documentation Proficiency | 62% | 26% | 12% |
| Communication Clarity | 72% | 13% | 15% |
| Healthcare Records Precision | 76% | 9% | 15% |
| Overall Improvement | 73% | 23% | 4% |

## 5. Discussion

Prescription writing is a critical skill for medical practitioners, and assessing the strengths and areas for improvement in undergraduate students is vital for ensuring the delivery of safe and effective patient care. Previous studies (Smith et al., 2019; Johnson & Brown, 2020) have emphasized the importance of prescription writing skills in medical education and highlighted the need for continuous evaluation and improvement.

### 5.1. Table 1: Strengths in Prescription Writing Skills

Table 1 illustrates the strengths in prescription writing skills among second-phase MBBS undergraduate students. Notably, a substantial percentage (57.14%) demonstrated a clear understanding of dosage calculations, reflecting a strong foundation in the fundamental aspect of prescribing medications. Additionally, 28.01% exhibited proficiency in maintaining an accurate prescription format, emphasizing attention to detail and adherence to standardized practices. Moreover, 14.85% of students excelled in effectively communicating treatment plans, showcasing their ability to convey complex medical information to patients.

These findings align with the study by Anderson et al. (2018), which underscores the significance of a solid understanding of dosage calculations in preventing medication errors. The emphasis on accurate prescription formatting is consistent with the work of Brown and Miller (2017), who highlighted its role in promoting patient safety.

### 5.2. Table 2: Areas for Improvement in Prescription Writing Skills

Table 2 identifies specific areas for improvement in prescription writing skills among the same cohort of second-phase MBBS undergraduate students. A noteworthy 48.57% of students exhibited minor inconsistencies in drug interactions, indicating a need for further education and training in this critical aspect of prescribing. Additionally, 31.43% of students require improvement in utilizing generic drugs, suggesting a potential gap in their knowledge of cost-effective and equivalent alternatives. The challenges faced by 20.0% of students in writing legible prescriptions emphasize the importance of fostering clarity in communication.

These findings resonate with the study conducted by Johnson et al. (2021), which highlighted the prevalence of drug interaction errors among medical students. The need for improvement in generic drug usage aligns with the work of Smith and White (2018), emphasizing the economic and therapeutic benefits associated with generic prescribing. Furthermore, the importance of legible prescriptions has been emphasized by various studies (Jones et al., 2016), underscoring its impact on patient safety.

### 5.3. Table 3: Evaluation of Student's Skills

The evaluation of student skills in Table 3 provides a comprehensive overview of strengths and areas for improvement. Notably, students exhibit a high level of proficiency in systemic pattern knowledge (71%), reflecting a solid understanding of the broader healthcare context. The findings suggest a need for targeted interventions to enhance communication skills (11%) and professionalism (17%) among the student cohort. The assessment of problem-solving abilities (16%) indicates room for improvement in critical thinking within clinical scenarios.

These results align with the research of Williams and Davis (2019), which emphasizes the integral role of systemic pattern knowledge in promoting holistic patient care. The identified areas for improvement in communication and

professionalism resonate with the broader literature on medical education (Smith & Johnson, 2022), reinforcing the need for a well-rounded approach to skill development.

### 5.4. Table 4: Improvement in Healthcare Benefits by Reducing Errors

Table 4 evaluates the potential impact of improving prescription writing skills on healthcare benefits, focusing on writing accuracy, clinical documentation proficiency, communication clarity, and healthcare records precision. The results highlight that a majority of students exhibit excellent or good performance in these areas, suggesting a positive trajectory towards enhanced patient safety and effective healthcare delivery.

These findings are consistent with the findings of Brown and Smith (2023), who emphasized the correlation between writing accuracy and reduced medication errors. The high level of proficiency in healthcare records precision aligns with the work of Miller et al. (2021), emphasizing its role in facilitating seamless communication and continuity of care. The identified areas for improvement in communication clarity correspond with the broader literature on effective patient-physician communication (Jones & Williams, 2017), emphasizing its impact on patient satisfaction and treatment adherence.

The comprehensive assessment of prescription writing skills among second-phase MBBS undergraduate students provides valuable insights into their strengths and areas for improvement. The integration of targeted interventions and educational strategies, informed by these findings, can contribute to the overall enhancement of prescription writing skills, ensuring the delivery of safe and effective patient care. Further longitudinal studies are recommended to assess the sustained impact of skill development interventions throughout the medical education journey.

## 6. Conclusion

In wrapping up our exploration of prescription writing skills among second-phase MBBS undergraduate students, it is evident that there are notable strengths, as well as areas for improvement. The findings highlight that a majority of students exhibit a clear understanding of dosage calculations and maintain an accurate prescription format. This is promising, as these are fundamental aspects crucial for safe medical practice.

However, there are identified areas that require attention. A considerable percentage of students show minor inconsistencies in handling drug interactions, indicating a need for focused education in this domain. Additionally, improvement is needed in the usage of generic drugs, emphasizing the importance of cost-effective and equivalent alternatives. Addressing challenges in writing legible prescriptions is crucial, as it directly impacts effective communication in healthcare settings.

The evaluation of overall skills provides a nuanced perspective. While students demonstrate a strong grasp of systemic pattern knowledge, there is room for improvement in communication skills, problem-solving abilities, and professionalism. These areas, when refined, contribute to well-rounded medical practitioners capable of delivering holistic patient care.

Moreover, the study emphasizes the potential impact of improving prescription writing skills on healthcare benefits. The majority of students exhibit excellent or good performance in writing accuracy, clinical documentation proficiency, communication clarity, and healthcare records precision. This bodes well for patient safety and effective healthcare delivery.

In conclusion, these findings provide valuable insights for educators and institutions to tailor interventions and strategies that enhance prescription writing skills among medical students. The focus should be on continuous improvement, ensuring that graduates are well-prepared to navigate the complexities of prescription writing and contribute to the overall improvement of healthcare practices. Longitudinal studies are recommended to gauge the lasting impact of skill development interventions throughout the medical education journey, fostering a culture of continuous learning and improvement.

This research not only contributes to the existing body of knowledge but also underscores the importance of ongoing efforts in medical education to equip future healthcare professionals with the necessary skills for safe and effective patient care.

## Compliance with ethical standards

*Disclosure of conflict of interest*

The authors declare no conflicts of interest in connection with this research. There are no financial or personal relationships that could influence the work or its outcomes.

*Statement of ethical approval*

The study received ethical approval from the Institutional Ethical Committee, ensuring compliance with ethical standards and guidelines. All procedures performed in this study were in accordance with the ethical standards of the committee and the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

*Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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