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**Original Research Article**

# Knowledge, attitude and practices related to drug prescription among medical officers and postgraduate residents in B. P. Koirala Institute of Health Sciences

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## ABSTRACT

**Background:** Pharmacology, being both basic and applied science, forms the backbone of rational therapeutics. Traditional teaching of pharmacology is teacher centered with emphasis on learning the facts on drugs. Inadequate knowledge may cause irrational prescribing which leads to huge loss of lives and money. Objective was to evaluate the knowledge, attitude and practices among doctors regarding prescription.
**Methods:** A semi-structured questionnaire was used among medical officers and postgraduate residents to collect the data regarding their undergraduate training in clinical pharmacology and therapeutics, prescribing habits, commonly consulted drug information sources and any perceived deficiencies in their undergraduate clinical pharmacology teaching. Descriptive statistics were calculated.
**Results:** Out of 116 respondents, 69 were males and mean age was 28.8±2.3 years. Ninety-eight (84.5%) participants were aware about teaching of prescription writing in their undergraduate course and 101 (87.1%) participants knew the parts of prescription. One hundred (86.2%) participants considered safety as the most important aspects of prescribing a drug. One hundred and four (89.7%) participants thought that undergraduate pharmacology training taught them to prescribe safely. One hundred and eleven (95.7%) thought that the undergraduate pharmacology teaching should be improved. Out of 116 participants, 84 (72.4%) had encountered problems while prescribing during their internship. Sixty-eight (58.6%) participants used internet as a source of information about safety, efficacy and cost of drugs for prescription. Ninety-five (81.9%) participants prescribed supplemental vitamins and irons according to patient need.
**Conclusions:** Majority of participants felt that they do have good knowledge in prescribing medicines and the training on prescription writing should be reinforced.

**Keywords:** Attitude, Knowledge, Practices, Prescription, Residents

## INTRODUCTION

Pharmacology is an important branch of the medical college curriculum, which gives knowledge about drugs to the medical students. It is crucial that medical students understand the importance of pharmacology and apply that knowledge appropriately in their future practice as clinicians.[1] Pharmacology teaching should aim to produce rational prescribers rather than producing confused practitioners in a society. Pharmacology teaching in traditional methods takes place through lectures and are more teacher centered, with emphasis on learning the facts and figures of drugs.[2]

Regular review of the teaching and evaluation methods through feedback from students and modification of the methodologies plays important role in planning the undergraduate medical curriculum.[3] Clinical

pharmacology and therapeutics (CPT) contemplates undergraduate (UG) medical students to be able to plan, select, communicate, and guide patients throughout their illness to use medicines and other devices. The main aim of CPT is to impart knowledge, skills, and attitudes so that a student is able to weigh the potential benefits and risks of treatment along with cost-effectiveness, understand the sources of variability in responses to medicine based prescribing decisions on sound evidence, and monitor medicine effects appropriately.[4] CPT has been integrated progressively into the UG curricula of many countries, such as the US, UK, India, Nepal, and the Netherlands, to improve in the prescribing knowledge and skills of doctors.[5-9]

Rational use of medicines is its correct use so that their selection, dose, duration are according to the guidelines, suitable for clinical needs, available at the lowest cost to the provider, community and patient and are dispensed correctly, taken properly and documented appropriately.[10] Widespread irrational prescription practice of medicine is a matter of serious concern that leads to unnecessary financial cost to patient, health service system, increased side effects out of pocket expenditure by patient.[11,12]

A report of national academy of science institute of medicine (2000) estimated that as many as 98,000 people die every year because of prescription errors. Prescription errors account for 70% of medication errors that could potentially result in adverse effects.[13] Few studies have shown prescribing error rate at 34% of total prescription.[14] Agrawal et al has recorded that 8.2% patients are likely to develop adverse drug event out of every thousand prescription.[15] According to a report by world health organization (WHO), 50% of all medicines are prescribed, dispensed or sold incorrectly, while 50% of patients fail to take their medicines satisfactorily.[16]

A large number of prescription errors are made without proper pharmacological knowledge. Interaction between drugs are the most frequently encountered error, followed by incorrect dosing intervals and incorrect dosing. The number of errors increases with age and the number of medicines prescribed.[14] The most common prescription-related errors in hospitals are due to poor prescribing by junior doctors.[17] Early sensitization of physicians about rational prescription writing during their internship phase by means of educational intervention/training program can reduce the number of prescription errors.[18] Changes in medical education in the last 20 years, an overburdened curriculum, and lack of focus on social sciences, there is less teaching in UG CPT and the availability of more potent drugs in the market with increase in aging population and frequent demand of polypharmacy make process of prescribing more difficult. System analysis shows that knowledge and training are relevant factors in causation and focused education will improve prescribing performance.[19] UG students are needed to educate and develop methods to improve their prescription knowledge.[20] Objective was to evaluate the knowledge, attitude and practices among medical officers and junior residents regarding prescription.

## METHODS

It was a cross sectional study among medical officers and junior residents at B. P. Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal from September-November 2018. The medical officers working at and junior residents studying at BPKIHS were enrolled. The participants who did not give written consent were excluded. The sample size was 93 which was calculated by using the formula $n=Z^2\times P\times Q/L^2$ where Z was 1.96, P was prevalence (92.63%), Q was complement of P and L was permissible error (6%) at 95% confidence interval and 80% power and 10% as nonresponders.[18] Purposive sampling method was used. A questionnaire was prepared based on relevant literature and was modified to suit our study population.[21,22] It consisted of questions on knowledge (10 items), attitude (2 items) and practice (10 items) related to undergraduate clinical pharmacology, rational prescribing, prescribing habits, commonly consulted drug information sources, confidence in drug use and deficiency in their undergraduate teaching. Participants were also asked to provide measures to improve the undergraduate pharmacology teaching. Ethical approval was received from institutional review committee, BPKIHS (IRC/1237/1018). Confidentiality of the information was assured to the participants. The questionnaire was handed to them after explaining the purpose of the study and after taking the written informed consent. They were asked to fill in the questionnaire and it was collected on the same day. The data were entered in Microsoft excel 2010. Descriptive statistics like mean, frequency and percentage were calculated. Findings were presented as graphs and tables.

## RESULTS

Out of 116 respondents, 69 (59.48%) were men with mean age of 28.8±2.3 years. About 102 (87.93%) participants were postgraduate residents and 110 (94.83%) were Nepalese (Table 1).

**Table 1: Sociodemographic profile of participants, (n=116).**

| Variables | | N | Percentage (%) |
|---|---|---|---|
| **Gender** | Male | 69 | 59.48 |
| | Female | 47 | 40.52 |
| **Age groups (years)** | 20-25 | 13 | 11.21 |
| | 26-30 | 86 | 74.14 |
| | >30 | 17 | 14.66 |
| **Academic stream** | PG residents | 102 | 87.93 |
| | Medical officers | 14 | 12.07 |
| **Nationality** | Nepalese | 110 | 94.83 |
| | Indian | 6 | 5.17 |

***Knowledge of prescription***

Ninety-eight (84.5%) participants were aware about teaching of prescription writing in their undergraduate course and 101 (87.1%) participants knew the parts of prescription. One hundred (86.2%) participants considered safety factor for drug prescription. One hundred and two (87.9%) participants thought to prescribe in generic name. Our result shows 104 (89.7%) participants thought that UG pharmacology training taught them to prescribe safely. Eighty-three (71.6%) participants did not know the concept of P drugs.

**Table 2: Responses of the participants towards knowledge of prescription, (n=116).**

| Questions on knowledge | Response | N (%) |
|---|---|---|
| **Was prescription writing taught in UG pharmacology teaching?** | Yes | 98 (84.5) |
| | No | 18 (15.5) |
| **Do you know the parts of prescription?** | Yes | 101 (87.1) |
| | No | 15 (12.9) |
| **What is/ are the most important aspects of prescribing a drug?** | Safety | 100 (86.2) |
| | Efficacy | 94 (81.0) |
| | Cost | 57 (49.1) |
| | Suitability | 32 (27.6) |
| **Are you aware of essential drug list of Nepal?** | Yes | 95 (81.9) |
| | No | 21 (18.1) |
| **In prescription writing, drug should be prescribed in:** | Generic name | 102 (87.9) |
| | Brand name | 14 (12.1) |
| **Have you been taught to consider cost of drugs?** | Yes | 95 (81.9) |
| | No | 21 (18.1) |
| **Are you aware of term pharmaco-economics?** | Yes | 62 (53.4) |
| | No | 54 (46.6) |
| **Are you aware of the concept of P drugs (personal drugs)?** | Yes | 33 (28.4) |
| | No | 83 (71.6) |
| **Has UG pharmacology training taught you to prescribe safely?** | Yes | 104 (89.7) |
| | No | 12 (10.3) |
| **How would you grade your prescribing knowledge as at graduation?** | Very poor/ poor | 1 (0.9) |
| | Average | 62 (53.4) |
| | Good/ excellent | 53 (45.7) |

***Attitude of prescription***

Eighty-seven (75.0%) participants felt that their undergraduate training has prepared them to prescribe rationally. Out of 116 participants, 111 (95.7%) thought that undergraduate Pharmacology teaching should be improved (Table 3). Participants asked to make suggestions to improve teaching methods. They suggested pharmacology teaching should be clinically oriented rather than exam-oriented, prescription writing should be as an integral part of practical exams, teaching should give more emphasis on project work and make more practical, assignment and presentations specific drug studies to every student should be conducted, teaching should be more focused on common diseases and their treatment, rather than rare diseases, more and more clinical visits to other hospitals should arranged.

**Table 3: Responses of the participants towards attitude of prescription, (n=116).**

| Questions on attitude | Response | N (%) |
|---|---|---|
| **Do you think that your undergraduate training has prepared you to prescribe rationally?** | Yes | 87 (75.0) |
| | No | 29 (25.0) |
| **Retrospectively, do you think undergraduate clinical pharmacology teaching should be improved?** | Yes | 111 (95.7) |
| | No | 5 (4.3) |

***Practice of prescription***

Eighty-four (72.4%) participants had encountered problems while prescribing during their internship period which are given as following: Insufficient knowledge of the brand names of drugs to be prescribed. As the pharmacology teaching mostly revolves around generic names, the doctors felt at a loss when required to write brand names. Insufficient knowledge of fixed-dose combinations, rational or irrational. Lack of knowledge of newly approved drugs. In UG teaching, the main focus is given on examination of the patient and diagnosing disease, rather than writing a correct prescription. Lack of experience of writing prescriptions in a clinical setting.

Ninety-five (81.9%) participants prescribed supplemental vitamins and irons according to patient need (Table 4). Fifty-nine (58.6%) participants used internet as a source for information about safety, efficacy and cost of drugs for prescription (Figure 1).

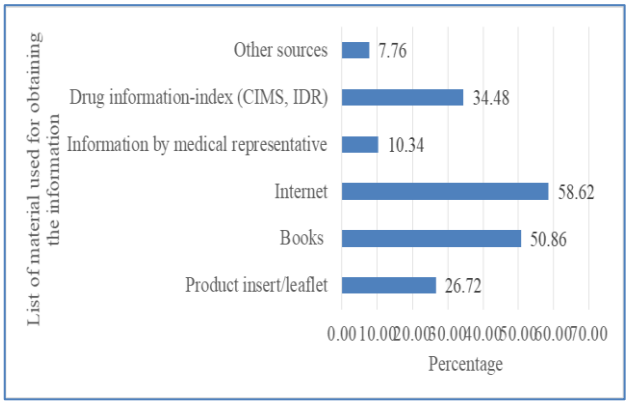


**Figure 1: List of material used for obtaining the information about safety, efficacy and cost of drugs before prescribing.**

**Table 4: Responses of the participants towards practice of prescription, (n=116).**

| Questions on practice | Response | N (%) |
|---|---|---|
| **What do you prefer, fixed dose drug combination or single drug?** | Single | 32 (27.6) |
| | Combination | 84 (72.4) |
| **Have you had any specific problems in prescribing during your internship training?** | Yes | 84 (72.4) |
| | No | 32 (27.6) |
| **Do you prescribe according to essential drug list?** | Yes | 60 (51.7) |
| | No | 56 (48.3) |
| **Do you check information about safety, efficacy and cost of drugs before prescribing?** | Yes | 111 (95.7) |
| | Yes | 5 (4.3) |
| **Usually, you prescribe the drug by which name** | Generic | 61 (52.6) |
| | Brand | 55 (47.4) |
| **Usually, in children you calculate the dose according to** | Age | 11 (9.5) |
| | weight | 110 (94.8) |
| | Height | 3 (2.6) |
| | Surface area | 1 (0.9) |
| **Usually, while writing prescription, do you consider cost of drugs?** | Yes | 99 (85.4) |
| | No | 17 (16.6) |
| **Do you prescribe a newly approved drug?** | Yes | 29 (25) |
| | No | 87 (75) |
| **Do you prescribe by parenteral influence even when not necessary?** | Yes | 20 (17.2) |
| | No | 96 (82.8) |
| **Do you prescribe supplemental vitamins and irons according to patient need?** | Yes | 95 (81.9) |
| | No | 21 (18.1) |

## DISCUSSION

The purpose of our study was to assess the prescribing knowledge of medical officer and post graduate residents in taking into consideration of undergraduate clinical pharmacology and therapeutics teaching. The present study showed that majority of participants were taught prescription writing in their UG pharmacology teaching and they rated their prescribing knowledge as average which was comparable to other findings.[21,22] Concept of preferred or personal (P) drugs was expected from many participants; however, only nearly one-third (28.4%) had this concept. Knowledge of P drugs concept enable doctors to avoid repeated searches for a good drug in daily practice and using own P drugs one would get to know their effects and side effects thoroughly with obvious benefits to the patient.[23,24]

Pharmacoeconomics is the field of science which describes and analyses the cost of drug therapy to the health care system and society. Knowledge of pharmaco-economics is very important in today's ever increasing drug market where availability of newer drug is increasing and cost consideration is very important. Majority of the participants of our study considered cost aspect of drug as they know about pharmacoeconomics.[21] More than three-fourths of the participants felt that their UG clinical pharmacology teaching had prepared them to prescribe safely and rationally. Similar findings were reported in a previous study.[21] Adequate safety and efficacy analysis are needed for rational prescription. More than two-thirds (72.4%) responders had encountered problems while writing prescription due to lack of knowledge of cost, safety, efficacy and dose of drugs. Majority of the participants felt that UG teaching should be improved and they suggested some points to improve teaching method. We should emphasize cost consideration, clinical oriented teaching, prescription writing as a part of practical examination, increase regular clinical posting to focus practical knowledge, regular training for safety, efficacy and rational prescribing.

Essential drugs are those which satisfy the priority healthcare needs of majority of population. The essential drugs list (EDL) is the foundation for every public health program for reduction of morbidity and mortality. It is the key strategy in helping to improve access to essential drugs and contributing to public health. Although majority (81.9%) of participants were aware of EDL, only half of them (51.7%) used to prescribe according to EDL. The contributing factors to this gap would be irregular access to essential medicines in developing countries, lack of availability of drugs and facilities or trained professionals to prescribe the drugs, inefficient pharmaceutical policies and management systems, poor funding and bad distribution and use.[25]

In the present study, the majority (95.7%) of participants checked drug information before prescribing. The most preferred source was internet, followed by books, drug information index, product inserts, and very few relied on information provided by medical representatives. We can obtain information about the safe and effective use of drugs, over-the-counter medications, herbal medicines, brand names and generic names of drugs, drug interactions, and treatment options from many websites.

It was interesting to find a gap between knowledge and practice among the participants towards rational prescribing. Although majority knew that generic prescribing should be practiced, only half (52.6%) of participants prescribed the drug by generic name in the present study. Drug prescribing in generic name is cost-effective and safe for the patient. It also decreases the potential for confusion and error. Therefore, generic prescribing should be emphasized.[26,27] Our study shows majority of participants calculate the dose by weight followed by age. Errors in calculating drug dose for children can lead to morbidity and mortality especially in

agents exhibiting a narrow therapeutic window. Pediatric residents often make such mistakes, which may be life-threatening. Dose calculation for children is usually done by using body weight, body surface area, age, or by a combination of these parameters.

Most of the respondents considered cost of drug in prescription writing which is beneficial for us as Nepal is poor country and poor people cannot afford expensive drugs for the treatment.

Parental influence on doctors while writing prescriptions is a common problem, but in this study majority (82.8%) of the participants refused to write under parental influence. Majority of the participants (81.9%) prescribed supplemental vitamin and iron preparations. Unnecessary vitamin and iron supplementation leads to polypharmacy, increased cost and adverse drug reaction. Therefore, this practice should be stopped as far as possible. The present study had small sample size and as it was conducted at a single center, the findings could not be generalized.

## CONCLUSION

From the present study we can conclude that we need to enhance our undergraduate pharmacology teaching. The undergraduate pharmacology teaching should be directed towards more practical approach which should include selection of drugs not only based on the efficacy but equal importance should be given to other parameters like safety and cost-effectiveness as well as increasing the knowledge of undergraduate students will help to increase rational prescribing as large proportion of undergraduates serve at rural centers.

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