

Effect of Clinical Pharmacology Internship on the Prescription Skills of Midwifery Students

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Abstract

Aims: In the current undergraduate midwifery curriculum, students in the pharmacology course have only learned theoretical aspects, and there is no possibility of objective observation at the bedside in the field of drug use. Therefore, there is a gap between applying theoretical content and the functional standards of medicine at the bedside. Considering the importance of the topic and the existing educational gap, the present study was conducted to investigate the effect of clinical pharmacology internships on the prescription skills of midwifery students of North Khorasan University of Medical Sciences.

Materials & Methods: This semi-experimental study was conducted on all North Khorasan University of Medical Sciences undergraduate midwifery students in 2021-2022. Twenty-two eligible students were selected by the available sampling method. Data collection tools were demographic and educational profile forms, practical tests (objective structured clinical) to measure prescription skills, needs assessment forms, and educational course satisfaction forms.

Findings: The students' mean score on the practical test]before and after the training was 8.50 ± 4.44 and 14.62 ± 1.92 , respectively, which had a significant difference ($p=0.001$).

Conclusion: The clinical pharmacology internship course positively affects midwifery students' prescription skills.

Keywords

Prescription [<https://www.ncbi.nlm.nih.gov/mesh/68055656>];
Clinical Pharmacology [<https://www.ncbi.nlm.nih.gov/mesh/68010601>];
Internship [<https://www.ncbi.nlm.nih.gov/mesh/68007396>];
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Introduction

Medicine is a strategic product and directly relates to people's health. Therefore, it is very important to pay attention to how it is prescribed and used in every field. Drug treatment is one of the most cost-effective medical interventions. The frequency of drug use in any country is one of the important indicators of its health system [1]. The World Health Organization (WHO) has estimated that more than 40% of medical expenses are spent on medicine [2,3].

Prescription is one of the main pillars of the rational treatment process. The correct and appropriate prescription of drugs is very important, such as quick and timely diagnosis [4]. A proper prescription should clearly explain the type of treatment, the amount of medicine needed, and the duration of the treatment to the pharmacist or any person delivering the medicine. In addition, it should be related to all the content of legal documents [4]. The drug therapy process includes five stages: ordering or prescribing, transcription, dispensing, administration, and monitoring [5-7].

Medical errors may occur at different stages of the drug therapy process, including the ordering or prescribing stage, the drug delivery stage, or the drug administration stage [8,9]. If sufficient attention is not paid to the details and principles of correct prescription, all the energy and time spent on diagnosis and treatment selection will be wasted [10]. Therefore, it is vitally important for students to acquire prescribing skills. This key skill should be acquired during studying and passing clinical pharmacology courses [10].

However, pharmacology education at the undergraduate level in most academic institutions is still done with traditional methods. During education, more emphasis is placed on diagnosing diseases than treating and using drugs. Therefore, there is no structured training on how to use pharmaceutical knowledge to treat patients in the real environment [2,11].

Studies have shown that the lack of pharmacology information relates to university education [12]. Therefore, students feel more about expanding education and strengthening pharmaceutical information [13]. In the current midwifery bachelor's curriculum, students take general and specific pharmacology courses (three courses in total). In these courses, students only learn the theoretical topics of drugs in pregnancy and gynecology, drug interactions, and prescription principles. The topics taught are theoretical, and objective observation of medication use is impossible.

Najafi *et al.*'s study showed that midwifery students were satisfied with visiting the pharmacy in the gynecology course [14]. Grandell *et al.*'s study showed that pharmaceutical skills are not desirable, and there is a gap between the application of theoretical content and functional standards of medicine in the clinic [15].

On the other hand, medical students require pharmacology skills to evaluate patients before receiving drugs, plan care goals, prescribe safe and

effective drugs, monitor and evaluate unwanted effects and side effects, educate the patient and his family about when and how to receive drugs, the reason for prescribing expectations from medicine, reaction to problems, helping families to provide care support, more effective cooperation with other treatment staff to eliminate possible risks and setting discharge plans.

Considering the importance of the topic and the existing educational gap, the present study aimed to investigate the effect of a clinical pharmacology internship course on the prescription skills of midwifery students of North Khorasan University of Medical Sciences.

Materials and Methods

The present research is a semi-experimental study. The research population was all North Khorasan University of Medical Sciences undergraduate midwifery students in the academic year 2021-2022. Among the midwifery students, 22 eligible students were selected by the available sampling method. The inclusion criteria included consent to participate in the research, studying in the 6th and 8th semesters of midwifery, and the exclusion criteria were non-participation in all educational stages or course tests and the occurrence of accidents during training sessions and course tests.

Data collection tools were demographic and educational profile forms, practical tests (objective structured clinical) to measure prescription skills, needs assessment forms, and educational course satisfaction forms.

Demographic and educational profile form: This form included age, level of interest in the field, Grade Point Average (GPA), residence status, marital status, preference for teaching pharmacology course by the professor, success in reading prescriptions correctly, success in writing prescriptions and feeling the need to complete a pharmacy internship.

Practical test (objective structured clinical): This test was used to evaluate prescription writing skills and included 18 items; the minimum score of each item was 0, and the maximum score was 1 (score range 0-18). This practical test was compiled based on the important chapters of pharmacology and prescribed drugs in the midwife's job description.

Needs assessment form: This form was used to determine the priority of midwifery students' training needs regarding the pharmacology course.

Educational course satisfaction form: Najafi *et al.* designed the questionnaire to measure students' satisfaction with the training course [14]. This form included 16 questions with a five-point Likert scale from "completely agree" (score 5) to "completely disagree" (score 1), where a higher score indicates more satisfaction.

After obtaining the necessary permits from the director of the study and development center and obtaining written consent from the students, a working group consisting of midwifery and pharmacy faculty members was formed to design how to conduct the training, the

duration of the training, evaluation, the implementation environment and the content of the training.

Then, qualified midwifery students came to the pharmaceutical skills center. At first, the researcher introduced himself and briefly described the research objectives. Then, during a face-to-face interview with 12 midwifery students in the 6th and 8th semesters, their opinions were qualitatively recorded regarding what students need to learn in the pharmacology course. After that, the pre-test was held. In the pre-test, students entered the pharmaceutical skills center, and the simulated scenario was provided. This scenario was a history of a woman with a vaginal infection, and the student had to prescribe the suggested drug treatment within 5 minutes. Then the necessary theoretical and practical training was provided in the field of different drug forms, prescription, components of prescription and legal aspects of prescription, important points when taking medicine, prescription errors, common prescriptions for vaginal infections in gynecology and pregnancy, FDA (Food and Drug Administration) classification regarding the use of drugs during pregnancy, drugs prohibited in pregnancy and breastfeeding, important side effects and possible drug interactions in common obstetrics and gynecology prescriptions.

After the training session, the post-test was held like the pre-test. Also, the educational course satisfaction form was completed by the students.

Data analysis was done using SPSS 24 software and descriptive statistics (frequency, mean and standard deviation). Paired t-test was used to compare the results before and after the course.

Findings

The mean age of the students was 22.50 ± 2.02 years old. Most students were single (81.8%) and native (50.0%). The GPA of the students was 16.98 ± 0.88 . 50.0% of the students preferred that the pharmacology course be taught by a team of pharmacology, midwifery, and gynecology professors. 83.3% of students reported the need to undergo a clinical pharmacology internship "high" and "very high" (Table 1).

Table 1. Frequency distribution of midwifery students' views on pharmacology course (n=22)

Students' views	%
Preference for teaching pharmacology course by the professor	
Pharmacology, midwifery, and gynecology	50.0
Midwifery	41.7
Gynecology	8.3
Success in writing prescriptions	
Low	16.7
Medium	41.7
High	25.0
Very high	16.7
Success in reading prescriptions correctly	
Low	8.3
Medium	58.3
High	16.7
Very high	16.7
Feeling the need to complete an urban pharmacy internship	
Low	8.3
Medium	8.3
High	33.3
Very high	50.0

The mean score of the practical test obtained by the students before and after the training was 8.50 ± 4.44 and 14.62 ± 1.92 , respectively, which had a significant difference ($p=0.001$; Table 2).

Table 2. The frequency (Percentage) of students' satisfaction levels from the urban pharmacy internship (n=22)

Items	Completely disagree	Disagree	No comments	Agree	Completely agree
1. The contents of the prescription course were new, and I was not familiar with them before.	8.3	0	8.3	41.7	41.7
2. After completing the prescription course, I have more confidence in treating outpatients.	0	0	0	25.0	75.0
3. After completing the prescription course, I have become more capable of dealing with outpatients.	0	0	0	33.3	66.7
4. After completing the prescription course, I have become more competent in writing prescriptions for outpatients.	0	0	8.3	33.3	58.3
5. In the future, I will use the material learned in the training course	0	0	0	41.7	58.3
6. Prescribing and medicine courses should be part of the standard education curriculum for students.	0	0	0	8.3	91.7
7. According to the available time, the number of topics taught is sufficient.	0	16.7	41.7	16.7	25.0
8. This course was helpful for me	0	0	0	16.7	83.3
9. Pharmacy prescription internship encourages students to strengthen their learning of theoretical material related to specialized pharmacology.	0	0	0	16.7	83.3
10. Pharmacy prescription internship creates interest and motivation for the active participation of students in the learning process.	0	0	0	16.7	83.3
11. Pharmacy prescription internship does not have much effect in reducing prescription errors.	41.7	41.7	8.3	0	8.3
12. Pharmacy prescription internship increases students' self-confidence in gynecology clinic internship.	0	0	0	16.7	83.3
13. Pharmacy prescription internship provides a better combination of theoretical and clinical content.	0	0	0	16.7	83.3
14. Through a pharmacy prescription internship, the student will better understand his/her strengths and weaknesses.	0	0	0	16.7	83.3
15. Pharmacy prescription training does not affect memorizing the dosage and appearance of the drug.	41.7	41.7	0	0	16.7
16. Pharmacy prescription training is effective in long-term memory learning of drug groups' effects and side effects.	0	0	0	41.7	58.3

The highest priority of midwifery students' training needs in the pharmacology course was common prescriptions for gynecology, such as uterine infections and bleeding (Table 3).

Table 3. The frequency of the priority of midwifery students' training needs regarding the pharmacology course (n=22)

Educational priorities	Percentage
Gynecology, such as uterine infections and bleeding	34.48
Herbal supplements related to gynecology and pregnancy	24.13
Skin and beauty drugs during pregnancy	6.89
Allowed supplements during pregnancy	24.13
Infertility drugs	3.44
Menopause drugs	6.89

Discussion

The present study aimed to investigate the effect of a clinical pharmacology internship course on the prescription. The results of the present study showed that a clinical pharmacology internship improves midwifery students' prescription skills.

The causes of weakness in the pharmacology course include the difficulty of pharmacology education, the lack of clarity and transparency in the educational program, the discussion about who should teach pharmacology, the discussion about the relationship between theory and the bedside, forgetting pharmaceutical materials, the lack of time to work at the bedside, and the lack of conformity of theoretical education with the practical needs of students [15-18].

Manias and Bullock state that although instructors find combined learning helpful in consolidating knowledge, students mostly prefer to have a dedicated course for pharmacology because they think that the combined approach leads to the superficiality of their learning and creates problems in the connection between theory and clinical practice. In combined courses, attention may focus more on educating students about the disease process or micro aspects of care, and pharmacology may be obscured [17].

The results of the present study showed that most students mentioned the need to pass a clinical pharmacology internship as "high" and "very high". Ebrahimi *et al.* found that less importance was given to the pharmacology course in the main undergraduate midwifery courses [19]. The results of Najafi *et al.*'s study showed that midwifery students are satisfied with implementing the gynecological disease course with a visit to the pharmacy [14]. Also, other needs assessment research results have shown that the development of desirable learning experiences is provided through the close connection of theoretical and practical knowledge [20, 21].

The positive points of learning experiences at the bedside include effective learning, short learning time, and short-term memorization, and its negative points are the high volume of teaching topics in the

course, the need to repeat the course presentation, course presentation in higher semesters, and its simultaneity with other related courses [22].

An effective teaching strategy is a combination of teaching strategies (theory combined with practice). In this way, students can learn the fundamental scientific principles in pharmacology and focus on aspects of clinical dynamics, planning, monitoring, and evaluation of patient care and drug management [18].

Instructors consider hybrid education helpful in consolidating knowledge. Still, students mostly prefer to take a pharmacology-specific course because they think a hybrid approach leads to superficiality in their learning and leads to problems, in theory, relevant to the clinic. In combined courses, attention may focus more on teaching the student about the disease process or micro aspects of care, and pharmacology may be hidden.

According to the results of the present study, clinical pharmacology internship can be included in the midwifery curriculum by revising the midwifery education program and topics.

The study's limitations were the absence of a control or intervention group with another method. It is suggested to conduct more studies comparing clinical pharmacology internships with other educational methods in the future.

Conclusion

Clinical pharmacology internship course positively affects midwifery students' prescription skills.

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Ethical Permissions: This research was approved by North Khorasan University of Medical Sciences by obtaining informed consent and respecting the confidentiality of individuals' information.

Conflicts of Interests: The authors declare no conflict of interest.

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