

## Pharmacotherapy and Pharmacology Textbooks at Jordanian Universities: A Content Analysis Study of Drug Use During Pregnancy

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### ABSTRACT

**Background:** The education of pharmacists on the benefits and risks associated with medication use during pregnancy, as well as the utilization of drug information resources to counsel pregnant women, is of paramount importance.

**Aim:** This study aimed to evaluate the adequacy of pharmacotherapy-related content in textbooks used by pharmacy colleges at Jordanian universities, particularly regarding drug use during pregnancy.

**Methods:** In this feasibility study, a content analysis was performed to provide an in-depth analytical description of pharmacology and pharmacotherapy textbooks and course syllabi utilized by pharmacy colleges at Jordanian universities.

**Results:** Three textbooks were analyzed, revealing inadequate coverage of key aspects related to pregnancy in pharmacology textbooks across all selected diseases. Only 5% of the diseases included pharmacologic therapy, contraindications, and drug effects on the fetus. Pharmacotherapy textbooks covered 21% of these aspects, addressing etiology, pathophysiology, diagnosis, non-pharmacological and pharmacological therapies, interactions, and contraindications for certain diseases. Reviewed course syllabi lacked any specific topics on pregnancy.

**Conclusion:** Pharmacotherapy during pregnancy is insufficiently covered in current textbooks, highlighting the need to update pharmacy curricula to ensure comprehensive coverage and better prepare pharmacists to counsel pregnant women effectively.

**Keywords:** pregnancy, pharmacology, pharmacotherapy

### INTRODUCTION

Maternal and child health care became a widespread concern due to the high prevalence of their mortality rates detected in the past three decades.<sup>1</sup> Maternal mortality was found to be caused by various obstetric factors such as hypertension, infections during pregnancy, septic

abortions, and obstetric hemorrhage, in addition to delivery complications.<sup>2</sup> Despite the prevalence of medication used during pregnancy, pregnancy-specific prescribing data is limited for most medications.<sup>3</sup> Pharmacists are readily reachable to mothers and children at any stage of the continuum of care for medication reviews, drug information, medication counseling, and monitoring drug use in pregnant women.<sup>4</sup>

Pharmacists' knowledge of medication benefits and risks during pregnancy and how to utilize drug-information

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resources to counsel pregnant women is important.<sup>5</sup> They play an essential role in preventing drug-related adverse effects. Moreover, assess the likelihood of fetal exposure, review prescriptions for appropriateness, and identify drug therapy-related problems.<sup>6</sup> The Bachelor of Pharmacy program in Jordan typically spans five years, encompassing a rigorous curriculum that combines theoretical coursework with practical training. The program is designed to ensure that students gain a holistic understanding of the field, covering essential areas such as pharmacology, medicinal chemistry, and pharmacotherapy. The program generally requires the completion of around 161 credit hours, although this may vary slightly between universities. These credit hours are distributed across core courses, elective courses, and practical training sessions, ensuring a well-rounded education.

Pharmacy education intends to qualify graduate students with the competencies to function within a large, complex healthcare system and to manage patients' drug therapies for myriad medical conditions, including pregnancy, thus curricula that integrate disciplines and theories with practice would be valuable.<sup>7</sup> According to a study conducted at Jordanian universities' pharmacy colleges, pharmacy students do not have enough knowledge of medication use during pregnancy.<sup>8</sup> Thus, this study aimed to identify to what extent pharmacotherapy during pregnancy is included in study materials at Jordanian pharmacy colleges and whether these materials qualify the students for dealing with pregnant women in the future.

## MATERIALS AND METHODS

The study employed a rigorous content analysis methodology to investigate the course syllabi and textbooks of pharmacology, clinical pharmacy, and therapeutics used at Jordanian pharmacy colleges, specifically three public and three private universities. A mixed-method approach was used to ensure a comprehensive evaluation, combining qualitative and

quantitative assessments.

### *Data Collection*

Data on textbooks were gathered from multiple sources to enhance the reliability of the findings. Initially, researchers obtained textbook information from each university's website. This was then corroborated by contacting relevant faculty members to confirm and update any missing information. Each identified textbook was accessed and reviewed through an accredited electronic library or directly from the relevant publishers to ensure accuracy.

### *Evaluation Tool and Validation*

A pre-validated evaluation form was employed for content analysis, developed through a detailed literature review and refined by a panel of experts in pharmacy education, clinical pharmacology, and content analysis. The evaluation tool underwent both content and face validity to ensure it adequately captured the key elements necessary for assessing pharmacology education. Additionally, inter-rater reliability was established by having two independent experts use the form to evaluate a pilot sample of textbooks. Holistic equation was used to assess the agreement, resulting in a value of 0.90, which indicates an excellent level of reliability<sup>9</sup>.

### *Content Analysis*

The content analysis included the three most widely used textbooks in each of the six universities, covering both public and private institutions. Each textbook was analyzed based on a comprehensive set of predetermined content aspects relevant to pharmacotherapy education. These aspects included etiology and pathophysiology, clinical presentation (signs and symptoms), diagnosis, non-pharmacological therapy, pharmacologic therapy (including drug class information), adverse effects, dosage and administration, interactions, contraindications, and the impact of the drug on the fetus during pregnancy.

The study specifically focused on the coverage of conditions relevant to pharmacotherapy during pregnancy, as these conditions are included in the curricula of the six

universities: diabetes, hypertension, dyslipidemia, asthma, nausea and vomiting, pain management, allergic rhinitis, gastroesophageal reflux disease (GERD), diarrhea, and constipation. For each condition, the textbooks were evaluated for comprehensiveness, accuracy, and consistency in the information provided.

#### *Data Analysis*

The findings from the content analysis were quantified using descriptive statistics to identify patterns and disparities between the textbooks used at public and private universities. Qualitative thematic analysis was applied to identify any gaps or biases in the content, providing a nuanced understanding of the strengths and limitations of the teaching materials.

#### *Reliability of Material Analysis*

To ensure the reliability of the content analysis, an independent expert, alongside the primary researcher, analyzed a randomly selected sample of the textbooks. Agreement between the two analyses was calculated using Holisti equation <sup>9</sup>, yielding a value of 0.90, indicating an excellent agreement and thereby reinforcing the reliability of the content evaluation.

## **RESULTS**

This study found that the Bachelor of Pharmacy program at the private universities included in the research allocates the first and second semesters of the third year and the first semester of the fourth year to pharmacology, with Pharmacology 1, 2, and 3 each comprising 3, 3, and 2 credit hours, respectively. Additionally, it was found that all private universities used the same pharmacology reference textbook, unlike public universities. However, the pharmacotherapy textbook was the same for both

public and private universities.

### **The Analysis of Pharmacology Textbook Adopted by Private Universities**

Table 1 demonstrates the analysis of the reference textbook used in private universities for third- and fourth-year pharmacy students. In the management of diabetes during pregnancy. It was found that only the definition of gestational diabetes was mentioned and only pharmacological therapy for hypertension during pregnancy such as methyldopa was discussed.

This study illuminated that medications contraindicated in pregnancy are reasonably listed in chapters on the management of hypertension, dyslipidemia, anti-inflammatory, antipyretic, and analgesic agents. For example, the contraindication of using ACE inhibitors, statins, misoprostol, and NSAIDs are contraindicated during the third trimester of pregnancy (frequency percentage=3%) was obviously mentioned. The effect of drugs on the fetus was discussed in the chapter on managing hypertension during pregnancy, where it was noted that ACE inhibitors, ARBs, and renin inhibitors have teratogenic effects (frequency percentage 1%). Etiology, clinical presentation, diagnosis, drug dosage and administration, adverse drug reactions, and drug interactions were not reported in pregnancy (frequency percentage=0%). While the etiology and pathophysiology, clinical presentation (signs and symptoms), diagnosis, non-pharmacological therapy, pharmacologic therapy (including drug class information), adverse effects, dosage and administration, interactions, and contraindications for all diseases have been well-documented for adults, this is not the case for special populations such as pregnant women.

**Table 1. The Analysis of Pharmacology Textbook Adopted by Private Universities**

	Diabetes	Hypertension	Dyslipidemia	asthma	Nausea and vomiting	Pain	Allergic rhinitis	(GERD	diarrhea	constipation	f (%)
Etiology/ Pathophysiology	0	0	0	0	0	0	0	0	0	0	0 (0%)
Clinical presentation (sign and symptoms)	0	0	0	0	0	0	0	0	0	0	0 (0%)
Diagnosis	0	0	0	0	0	0	0	0	0	0	0 (0%)
Non- pharmacological therapy	0	0	0	0	0	0	0	0	0	0	0 (0%)
Pharmacologic therapy-drug class information	0	1	0	0	0	0	0	0	0	0	1 (1%)
Dosage and Administration	0	0	0	0	0	0	0	0	0	0	0 (0%)
Adverse effects	0	0	0	0	0	0	0	0	0	0	0(0%)
Interactions	0	0	0	0	0	0	0	0	0	0	0 (0%)
Contraindications	0	1	1	0	0	1	0	0	0	0	3 (3%)
Drug effects on fetus	0	1	0	0	0	0	0	0	0	0	1 (1%)

0 indicates that the information is missing.

1 indicates the presence of information.

(f): frequency and (%): the percentage.

### **The Analysis of Pharmacology Textbook Adopted by Public Universities**

The BSc pharmacy program at public universities dedicates the first and second semesters of the third year to the study of pharmacology, with three credit hours each. The reference textbook used by the public universities provides the definition of gestational diabetes and mentions pharmacological therapies for gestational diabetes, high blood pressure, and nausea and vomiting,

including the use of insulin, methyldopa, and the combination of doxylamine and pyridoxine respectively.

In contrast, the reference textbook used by the private universities in this study provides detailed information on the contraindications and effects of drugs on the fetus during pregnancy for several drugs, including ACE inhibitors, ARBs, aliskiren, niacin, and lubiprostone. It also highlights that long-term use of opioids by the mother often leads to dependence in the fetus and

**Table 2. The Analysis of Pharmacology Textbook Adopted by Public Universities.**

	Diabetes	Hypertension	Dyslipidemia	asthma	Nausea and vomiting	Pain	Allergic rhinitis	GERD	Diarrhea	Constipation	f (%)
Etiology/ Pathophysiology	0	0	0	0	0	0	0	0	0	0	0 (0%)
Clinical presentation (sign and symptoms)	0	0	0	0	0	0	0	0	0	0	0 (0%)
Diagnosis	0	0	0	0	0	0	0	0	0	0	0 (0%)
Non-pharmacological therapy	0	0	0	0	0	0	0	0	0	0	0 (0%)
Pharmacologic therapy-drug class information	1	1	0	0	1	0	0	0	0	0	3 (3%)
Dosage and Administration	0	0	0	0	0	0	0	0	0	0	0 (0%)
Adverse effects	0	1	0	0	0	0	0	0	0	0	1 (1%)
Interactions	0	0	0	0	0	0	0	0	0	0	0 (0%)
Contraindications	0	1	1	0	0	0	0	0	0	0	2 (2%)
Drug effects on fetus	0	1	0	0	0	0	0	0	0	0	1 (1%)

0 indicates that the information is missing.

1 indicates the presence of information.

(f): frequency and (%): the percentage

newborn. Furthermore, this textbook lists several medications within the FDA pregnancy category system (A, B, C, D, and X) used to treat GERD, diarrhea, and constipation.

The analysis of the textbook adopted by the participating public university is presented in Table 2.

Beyond the scope of the analyzed diseases, the textbook includes a chapter on drug therapy during pregnancy. This chapter explains pharmacokinetics and pharmacodynamics, as well as potential toxic and teratogenic effects on the fetus. A table listing significant teratogenic drugs is also provided.

In this study, most aspects were not met for all selected diseases (frequency percentage = 7%). Previous

pharmacology textbooks have detailed explanations for the adult population, aiming to equip pharmacy students with the skills to work in diverse healthcare systems and manage patient medications for various medical disorders. However, these textbooks lack sufficient data on pharmacotherapy during pregnancy. The information is scattered and not covered in enough depth for pharmacy students to properly acquire the necessary knowledge.

**The Analysis of Pharmacotherapy Textbook Adopted by Public and Private Universities**

The results of the textbook analysis on pharmacotherapy are presented in Table 3, which serves as the primary reference for both public and private universities. The etiology of nausea and vomiting, GERD,

and constipation during pregnancy is mentioned (frequency percentage = 3%). The proposed causes of common gastrointestinal issues during pregnancy, such as nausea, vomiting, heartburn, and constipation, are multifactorial. Nausea and vomiting may be attributed to hormonal stimuli, evolutionary adaptation, and psychological predisposition, while heartburn can be attributed to hormonal effects on the esophageal muscle

and lower esophageal sphincter, as well as physical factors from the enlarging uterus. Additionally, natural defense mechanisms like anatomic factors, esophageal clearance, and mucosal resistance may play a role. Constipation, on the other hand, can be caused by depressed gut motility, increased fluid absorption from the colon, and the use of iron supplements

**Table 3. The Analysis of Pharmacotherapy Textbook Adopted by Public and Private Universities.**

	Diabetes	Hypertension	Dyslipidemia	asthma	Nausea and vomiting	Pain	Allergic rhinitis	GERD	Diarrhea	Constipation	f (%)
Etiology/ Pathophysiology	0	0	0	0	1	0	0	1	0	1	3 (3%)
Clinical presentation (sign and symptoms)	0	0	0	0	0	0	0	0	0	0	0 (0%)
Diagnosis	1	1	0	0	0	0	0	0	0	0	2 (2%)
Non-pharmacological therapy	1	0	1	0	1	0	0	0	0	0	3 (3%)
Pharmacologic therapy-drug class information	1	1	1	1	1	0	0	1	0	0	6 (6%)
Dosage and Administration	0	0	0	0	0	0	0	0	0	0	0 (0%)
Adverse effects	0	0	0	0	0	0	0	0	0	0	0 (0%)
Interactions	1	0	0	0	0	0	0	0	0	0	1 (1%)
Contraindications	0	1	1	0	1	0	0	0	0	0	3 (3%)
Drug effects on fetus	1	1	1	0	0	0	0	0	0	0	3 (3%)

0 indicates that the information is missing.

1 indicates the presence of information.

(f): frequency and (%): the percentage.

The textbook provided a thorough and informative discussion on diagnosing diabetes and hypertension. Hypertension during pregnancy includes preeclampsia, eclampsia, chronic hypertension, preeclampsia

superimposed on chronic hypertension, and gestational hypertension. Preeclampsia features high blood pressure ( $\geq 140/90$  mm Hg on two occasions at least 4 hours apart or  $\geq 160/110$  mm Hg confirmed shortly) and proteinuria

after 20 weeks, potentially leading to severe complications, while eclampsia involves seizures in preeclamptic patients and is a medical emergency. Chronic hypertension exists before pregnancy, superimposed preeclampsia combines chronic hypertension with preeclampsia symptoms, and gestational hypertension occurs after 20 weeks without severe range ( $\geq 160/110$  mm Hg). Gestational diabetes mellitus (GDM) develops during pregnancy due to hormonal changes that increase insulin resistance, and it occurs when the mother cannot produce enough insulin. Women with GDM are at higher risk of developing type 2 diabetes later, so early detection and treatment starting at the first prenatal visit are crucial. Treatment goals include maintaining fasting glucose below 95 mg/dL and postprandial levels below 140 mg/dL (1-hour) or 120 mg/dL (2-hour), while pregnant women with preexisting diabetes should aim for an A1C target between 6% and 6.5%.

The textbook provides a comprehensive overview of the pharmacological management of several medical conditions, including diabetes, hypertension, dyslipidemia, asthma, nausea and vomiting, and gastroesophageal reflux disease (GERD), with a frequency percentage of 6%. For instance, during pregnancy, diabetes patients may need to intensify their insulin regimen to meet stricter therapeutic goals, using complex regimens and frequent blood glucose monitoring. NPH and insulin detemir are recommended basal insulins, with insulin pump therapy as a beneficial option for motivated patients. Furthermore, metformin and glyburide are studied alternatives for women with type 2 diabetes or gestational diabetes mellitus.

Similarly, for treating severe hypertension, preeclampsia, and eclampsia during pregnancy, several medications are recommended. Labetalol, long-acting nifedipine, or methyldopa are preferred due to their favorable safety profiles. Additionally, other beta-blockers (excluding atenolol) and calcium channel blockers (CCBs) are also reasonable alternatives, while ACE inhibitors, ARBs, and direct renin inhibitors are contraindicated due to

their teratogenic effects. In this context, it is noteworthy that in July 2021, the FDA updated guidelines allowing statins for pregnant patients with high cardiovascular risk, though most should discontinue use and avoid statins while breastfeeding. Furthermore, women of childbearing age on statins should use reliable contraception and stop statins 1-2 months before pregnancy, as there is limited safety data on other cholesterol-lowering drugs during pregnancy.

Moreover, asthma control during pregnancy is essential to prevent complications such as perinatal mortality and preterm birth. Treating asthma with inhaled corticosteroids or albuterol is safer than leaving it uncontrolled, though the safety of newer biological treatments is unknown. Therefore, regular monitoring and aggressive treatment of exacerbations are necessary to ensure a normal pregnancy.

In addition, the American College of Obstetricians and Gynecologists (ACOG) recommends starting a prenatal vitamin one month before pregnancy to help prevent nausea and vomiting during pregnancy (NVP). Dietary changes, lifestyle modifications, and ginger can manage symptoms, with pyridoxine (vitamin B6) and doxylamine as first-line therapy for persistent NVP. Severe cases may require intravenous hydration, and ondansetron, promethazine, and metoclopramide are effective for hyperemesis gravidarum, with glucocorticoids recommended after 10 weeks to reduce the risk of cleft lip.

Drug effects on the fetus have been reported in diabetes, hypertension, and dyslipidemia treatments. Metformin and glyburide are alternatives to insulin for women with type 2 diabetes or GDM, appearing effective and safe but requiring further research. Glyburide is not detected in cord serum, while metformin crosses the placenta. Women with GDM need evaluation post-delivery and periodic screening due to a high risk of developing type 2 diabetes. ACE inhibitors, ARBs, and direct renin inhibitors are contraindicated due to fetal toxicity.

In this study, approximately 21% of the pharmacotherapy textbook content specific to pregnancy was addressed.

Conversely, all aspects of the adult population (non-pregnant) across various diseases were thoroughly covered, offering pharmacy students a comprehensive understanding of disease management. The principles applicable to non-pregnant adults—such as disease signs and symptoms, non-pharmacological therapy, diagnosis, drug dosage and administration, and drug interactions—may also be relevant to pregnant women.

The syllabi of pharmacology and pharmacotherapy courses from six public and private universities were reviewed, including the course description, aim, outcomes, program competencies, intended learning outcomes, and content. Terms related to pregnancy were absent in all reviewed materials.

## **DISCUSSION**

This study stands out as the only one to review multiple books, meticulously searching for topics related to certain diseases and treatments during pregnancy. By examining various sources, the study aimed to identify and evaluate the extent of coverage given to pregnancy-specific pharmacotherapy. It highlighted that while some aspects were addressed, there remains a significant gap in comprehensive information tailored to pregnant women. This analysis underscores the need for more focused content in educational resources to adequately prepare pharmacy students for managing the unique challenges of disease treatment during pregnancy. The study's findings emphasize the importance of expanding and enhancing the available knowledge to ensure that future pharmacists are equipped with the skills necessary to make informed therapeutic decisions and provide optimal care for pregnant patients.

A comprehensive overview of various pharmacotherapy textbooks reveals distinct approaches and valuable resources for medical and pharmacy students, as well as practitioners.

The "Principles and Application in Pharmacotherapy" textbook is meticulously divided into two parts: principles

and application. Part 1 delves into the creation of new drugs and the principles of molecular, systems, and clinical pharmacology. Part 2, on the other hand, discusses therapeutic applications across 15 sections, including cardiovascular, neuropharmacologic, and psychopharmacologic therapeutics. Each monograph includes a 'Pharmaceutical comment' section, providing concise information relevant to health professionals. Furthermore, the CD-ROM version of this text includes comprehensive information on herbal medicines, their quality, safety, efficacy, and potential interactions, making it an invaluable resource for pharmacists, health professionals, and students.<sup>10</sup>

Similarly, "Basic and Clinical Pharmacology and Therapeutics", a textbook by Dr. Gaitonde and Dr. Telang, aims at undergraduate medical and pharmacy students, as well as postgraduate students in pharmacology or medicine. It covers 74 chapters across 13 sections and three appendices, presenting information in simple language with helpful schematic diagrams. Key points are highlighted for easy revision, and newly introduced drugs are included. The book also discusses drug policy, pharmacovigilance, and drug use in special populations such as pregnant women, children, and the elderly. While the text could benefit from more colorful diagrams and specific highlights of drug features, it remains a useful addition for pharmacology students.<sup>11</sup>

In contrast, "Clinical Pharmacology" textbooks for medical students face the challenge of providing concise treatment information while fostering critical thinking about drug use. The fourth edition of one such textbook adopts a traditional approach, covering general principles and therapeutic treatments for common diseases. While attractively laid out with adequate visual aids, it lacks chapters on practical drug administration aspects and does not adequately address adherence issues. Although it provides a comprehensive overview of therapeutics, it falls short in promoting the critical approach necessary for optimal drug use. Despite some omissions of recent

advances, it remains a reasonable core text for therapeutics teaching, though integrated pharmacology and clinical pharmacology departments might consider more comprehensive alternatives.<sup>12</sup>

Meanwhile, "A Textbook of the Practice of Medicine", primarily an internal medicine and diagnosis textbook, is a valuable resource for both medical students and practitioners. The thoroughly revised thirteenth edition reflects the book's long-standing utility in the profession. It provides up-to-date, concise, yet sufficiently detailed material that is easily accessible for reference. The authors successfully correlate pathology and morbid physiology with clinical and therapeutic aspects of disease, emphasizing the interdependence of these phases. New material on focal infection and kidney function has been added alongside the existing section on nervous system diseases.<sup>13</sup>

Additionally, George's Textbook of Adverse Drug Reactions organizes the text by bodily systems after the introductory chapters, making it practical for doctors. The sections on the ear, nose, and throat are particularly helpful, although the eye section is somewhat brief. The book is well-produced, and easier to use than Meyler and Herxheimer's classic, though pharmacists will need additional resources for comprehensive drug interaction information.<sup>14</sup>

Lastly, Gray et al. reviewed a comprehensive text on "Ocular Pharmacology" that provides an extensive review from basic principles to clinical applications of current drugs, enriched with historical perspectives and future insights. The book is divided into sections covering various ocular conditions and treatments, making it a valuable reference for ophthalmic libraries. It is particularly useful for clinicians and research scientists involved in ophthalmic work, highlighting the depth of knowledge required in this field.<sup>15</sup>

### **Limitations**

Our study focused on textbooks alone. However, they are not the sole learning materials in classrooms; electronic learning media are also increasingly used, particularly post-

COVID19 pandemic; other paper-based learning materials can sometimes be available, including clinical guidelines, electronically searchable online applications, and drug and disease databases. However, extra materials are unlikely to be sustainable if they are not integrated into the curriculum.

### **CONCLUSION**

In conclusion, while the textbooks currently used to teach pharmacy students provide a robust foundation in pharmacotherapy, they fall short in adequately addressing the complexities of medication use during pregnancy. The safety considerations and therapeutic strategies required for managing pregnant patients are often underrepresented or insufficiently detailed. Given the critical importance of optimizing maternal and fetal health outcomes, it is imperative that pharmacy curricula incorporate more comprehensive material on pregnancy-related pharmacotherapy. This should include in-depth discussions on the safety profiles of medications, the management of common pregnancy-related conditions, and the impact of pharmacological interventions on both mother and child. By enhancing the educational content in this area, we can better prepare future pharmacists to provide informed, effective care to pregnant patients, ultimately improving health outcomes for this vulnerable population.

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### **conflicts of interest**

The authors declare they have no conflicts of interest

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## الكتب الدراسية في علم الأدوية والعلاج الدوائي في الجامعات الأردنية: دراسة تحليلية لمحتوى استخدام الأدوية أثناء الحمل

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### ملخص

**خلفية الدراسة:** تعليم الصيادلة حول الفوائد والمخاطر المرتبطة باستخدام الأدوية أثناء الحمل، بالإضافة إلى استخدام مصادر معلومات الأدوية لتقديم المشورة للنساء الحوامل، أمر ذو أهمية قصوى.

**الهدف:** هدفت هذه الدراسة إلى تقييم كفاية المحتوى المتعلق بالعلاج الدوائي في الكتب الدراسية المستخدمة من قبل كليات الصيدلة في الجامعات الأردنية، خاصةً فيما يتعلق باستخدام الأدوية أثناء الحمل.

**المنهجية:** في هذه الدراسة التمهيدية، تم إجراء تحليل محتوى لتوفير وصف تحليلي متعمق للكتب الدراسية في علم الأدوية والعلاج الدوائي والمناهج الدراسية المستخدمة من قبل كليات الصيدلة في الجامعات الأردنية.

**النتائج:** تم تحليل ثلاثة كتب، وكشفت النتائج عن تغطية غير كافية للجوانب الرئيسية المتعلقة بالحمل في كتب علم الأدوية لجميع الأمراض المختارة. شملت 5% فقط من الأمراض العلاج الدوائي، وموانع الاستخدام، وتأثيرات الأدوية على الجنين. غطت كتب العلاج الدوائي 21% من هذه الجوانب، بما في ذلك الأسباب، الفيزيولوجيا المرضية، التشخيص، العلاجات غير الدوائية والدوائية، التفاعلات، وموانع الاستخدام لبعض الأمراض. كما لم تتضمن المناهج الدراسية أي موضوعات تتعلق بالحمل.

**الاستنتاج:** تُظهر الدراسة أن العلاج الدوائي أثناء الحمل غير مغطى بشكل كافٍ في الكتب الدراسية الحالية، مما يؤكد الحاجة إلى تحديث مناهج الصيدلة لضمان تغطية شاملة وإعداد أفضل للصيادلة لتقديم المشورة للنساء الحوامل بشكل فعال.

**الكلمات الدالة:** الحمل، علم الأدوية، العلاج الدوائي.

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