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Consumption of Prescription and non-Prescription Medications by Pregnant Women: A Cross Sectional Study in Palestine.

Ansam F. Sawalha,
Poison Control and Drug Information Center (PCDIC),
An-Najah National University, Nablus, Palestine. **e-mail**:
ansam@najah.edu

Abstract: Background and aims: Maternal intake of medications and supplements has changed over time, and it may be related to adverse reproductive outcomes. The purpose of this study was to evaluate the extent of utilization of supplements, medications, and herbs by pregnant women in Palestine and the expected effects. **Methods:** Pregnant women attending the prenatal clinic at Rafedia Governmental Hospital at Nablus/Palestine were interviewed using a questionnaire containing questions regarding medications intake and disease status. Data obtained from pregnant women were entered and analyzed using Statistical Package for Social Sciences (SPSS) version 10. **Results:** Of the pregnant women attending Rafedia prenatal clinic, 70.2% were village residents, 89.9% of them had no chronic diseases at the time of pregnancy except for anemia which was a common condition. More than half of the pregnant women did take vitamins, iron, and calcium (56.4%, 63.3%, 57.8%, respectively) during pregnancy. Less than fifty percent of the pregnant women took folic acid. Nausea and vomiting were common but most women did not take any medications to treat it. Less than one third of the pregnant women took over the counter (OTC) medications, mainly analgesics, and more than two thirds took prescription only medications (POM), mainly antibiotics. Mean medication intake per pregnant woman was 1.6±0.9. Most of the women who took medications did take only one (44.5%), a lesser percentage took two (30.8%) or more (9.3%) medications. The medications taken belonged to categories B and C, and few belonged to category D. About 45% of pregnant women used herbal medications to treat mainly GIT problems such as upset stomach, diarrhea, and constipation. The majority of pregnant women in this study did not visit a dentist during their pregnancy. **Discussion and Conclusion:** In this study, utilization of OTC, POM, and herbal medications was common among pregnant women. Not all women received supplements, particularly folic acid. The majority of pregnant women were anemic yet they did not take iron as they should. Women and health care providers need to be educated about the importance of supplement intake during pregnancy. Self-medicating or doctors prescriptions of POM, OTC, and herbal medications during pregnancy support the importance of expanding the knowledge about the potential risks and benefits of such treatments.

Keywords: medication utilization, pregnancy, Palestine, potential risk, supplement, herbal medications.

استهلاك الحوامل للأدويه: دراسة في فلسطين

الملخّص: **الأهداف**: تناول الأدوية والمقويات من قبل النّساء الحوامل قد تغيّر مع الوقت ، قد تكون الآثار السلبية على الجنين هي السبب بذلك. الهدف من هذه الدّراسة هو تقييم درجة استهلاك الفيتامينات، والأدوية، والأعشاب من قبل النّساء الحوامل في فلسطين والآثارالسلبيه المتوقّعة نتيجة لذلك.
الطريقة: مقابلة النّساء الحوامل اللواتي يراجعن عيادة النّسائية و التوليد في مستشفى رفيديا الحكومي، ومن ثم تعبئة نموذج يشتمل على أسئلة بخصوص تناول الأدوية، وكذلك الحالة المرضية. تمَّ تحليل النتائج عن طريق إدخالها إلى برنامج إحصائي (SPSS) والقيام باجراء الفحوص الإحصائية. **النتائج**: من بين النساء الحوامل اللواتي يراجعن العيادة النّسائية في مستشفى رفيديا 70.2% من سكان الريف، و 89.9% لا يعانين من أية أمراض مزمنة عند إجراء الدراسة باستثناء فقر الدم الذي كان شائعا. أكثر من نصف النّساء الحوامل في هذه الدراسة قُمنَ بتناول الفيتامينات، و الحديد، و الكالسيوم (56.4% ،63.3% ، و57.8% على الترتيب) خلال فترة الحمل. أقل من نصف الحوامل تناولن حامض الفوليك. الغثيان و التقيؤ كانا شائعين ولكن أغلب النساء لم يتناولن أية أدوية لمعالجتهما. أقل من ثلث الحوامل أخذنَ أدوية بدون وصفة طبية، خاصة المسكنات، بينما قام حوالي ثلثين منهن بأخذ أدوية بوصفة طبية خاصة المضادات الحيوية . متوسط تناول الأدوية كان 0.9± 1.06. معظم النساء الحوامل اللواتي تناولن الأدوية قمن بتناول دواء واحد فقط (44.5%)، وقامت نسبة أقل بتناول دوائين (30.8%) أو أكثر (9.3%). الأدوية التي تم تناولها تنتمي إلى الفئات "ب" و "ج" ، و القليل ينتمي للفئة "د" . حوالي (45%) من الحوامل استخدمن الأعشاب الطبية خاصة لعلاج مشاكل القناة الهضمية. معظم الحوامل في هذه الدراسة لم يراجعن طبيب الأسنان خلال فترة الحمل. **المناقشه والتوصيات**: في هذه الدراسة استعمال الأدوية بوصفة أو بدون وصفة طبية كان شائعاً بين النساء الحوامل. لم تتناول كل النساء الفيتامينات خاصة حامض الفوليك. أغلب الحوامل كُنَّ يعانين من الأنيميا ومع ذلك لم يتناولن حبوب الحديد. يجب أن يتم تعريف النّساء و مقدمي الخدمات الصحّية بأهمية تناول الفيتامينات خلال الحمل. إن التطبيب الذاتي أو استعمال الأدوية والأعشاب بوصفة طبيّة يعزز أهمية توسيع مدى المعرفة حول المخاطر المحتملة و الفوائد من هذه المعالجات.

Introduction

Medications are important for improving human health and promoting well being. However, it is crucial to weigh the risks and benefits for medications in order to be used rationally. Although many women take medications during pregnancy, the extent and type of medications prescribed to them are difficult to ascertain [1-3]. Medication use by pregnant women should be viewed as a public health issue, since there are numerous gaps in knowledge on the consequences for both the mother and the fetus. Pharmacoepidemiological studies can help to minimize the inherent risks in drug treatment by establishing a profile of drug

consumption during pregnancy, providing an evaluation of this service, and identifying intervention measures [4].

Exposure to any chemical during pregnancy could affect the fetus, this includes medications, supplements, herbal therapy, as well as, environmental components. Many studies have been conducted worldwide to study the attitudes, knowledge, and the exposure to medication and supplement during pregnancy [5-11]. Other research focused mainly on the utilization of complementary and alternative medicine by pregnant women [12-14]. No studies were found demonstrating the exposure of pregnant women to medications in Palestine on PubMed search (keywords: drug utilization in pregnant women in Palestine, prescribing patterns during pregnancy in Palestine, medications during pregnancy in Palestine). Moreover, in Palestine, due to easy availability of medications coupled with the inadequate health services, many people, including pregnant women, can obtain most of the medications desired without prescriptions. Consequently, those consumers are at risk of adverse drug reactions and poor therapeutic outcomes. In order to gain knowledge on the factors influencing pregnant women's supplement, medication, and herbs use and potential adverse effects, this pharmaco-epidemiological study was conducted.

Methods

The present descriptive, analytical, cross-sectional study was conducted in the prenatal clinic/Rafedia Hospital which is a governmental referral hospital in north Palestine. It has more than 150 beds and offers medical services for residents who hold governmental insurance. The obstetric and gynecology (OBGYN) clinic at Rafedia hospital serves pregnant women and functions six days a week. In this study, all pregnant women who attended the OBGYN clinic were interviewed using a pre-tested questionnaire. Each pregnant woman was interviewed only once regarding drugs used in the present pregnancy since conception in order to study drug utilization practices, as well as, other pregnancy related issues. Fifth year pharmacy students conducted the interviews after being trained to do so. The questionnaires were filled by students while performing the interview. Pregnant women were interviewed in local language after getting their verbal consent and approval by the medical ethics committee. Each pregnant woman was interviewed only once, and the study was carried out over a period of three consecutive weeks starting August 9, 2006.

A total of 218 pregnant women were interviewed, and the data obtained were filled in the questionnaire and used for future analysis. The

questionnaire consisted of four sections. The first section contained questions regarding age, place of residence, educational level, smoking habit, monthly income, number of children, number of previous pregnancies, and number of fetuses in the current pregnancy. There were also questions related to having gestational diabetes, or a premature baby earlier in life, and the last hemoglobin reading. Pregnant women were also asked whether they have experience nausea and vomiting and whether a drug has been prescribed to treat it. The second section was concerned with supplement intake. Pregnant women were asked whether they have taken vitamins, calcium, iron, and folic acid. Women who responded with "yes" were then asked to determine the month at which they started the supplement of concern. The third section focused on utilizing drugs with or without prescription. Pregnant women were asked if they have taken medications without prescription, if so, what medications have they utilized, and what was the reason. The same questions were also asked relating to prescription only medications (POM). Pregnant women were also asked about how many medications they have utilized excluding supplements and anti nausea treatments. Pregnant women were also asked if they have visited a dentist during this current pregnancy and whether a medication has been prescribed for them. The fourth section of the questionnaire had questions about utilization of herbal medication. Pregnant women were asked whether they have used herbals or not. Those who responded positively regarding herbal medications were presented with a list of herbs to select what they have used. There were also questions about the reasons to use herbal medications, and who gave the advice to use them during pregnancy. All drugs used by pregnant women in this study were further classified into categories A, B, C, D, and X according to the Food and Drug Administration (FDA) classification introduced in 1979.

In this FDA classification, the medications that are the safest to be used during pregnancy were classified as category A, while the medications that are correlated with fetal abnormalities were included into X. The drug categories were identified based on Micromedex products 2006 [15].

Data were entered and analyzed using Statistical Package for Social Sciences (SPSS) version 13 for windows. Descriptive statistics included mean, standard deviation, and percentages. Analytical statistics include Cross tabulation in which chi square was used to test for significance. Significance was considered to exist when the *P* value was equal or less than 0.05.

Results:

The analysis included the data of 218 pregnant women. The average age of the participants was 28.1± 5.7 years, most of the participants were multi-para (an average of 3.8± 2.4 previous pregnancies), have an average of three children, and 8.3% had previously given birth to premature baby. Most of the participants live in villages, had elementary or school education, and had moderate incomes. At the time of the interview, 90% of women did not suffer from any chronic disease. However, a small percentage (4.1%) was having hypertension and 2.3% were having gestational diabetes. 81.4% of the pregnant women who were interviewed had hemoglobin level <12 mg/dL (mean blood hemoglobin level of 10.9 ± 1.5 mg/dL). Sixty seven percent of clinic attendants were in their last pregnancy trimester, and 95% did not smoke. Baseline characteristics of the sample studied are shown in Table 1.

The results indicated that the total intake of vitamins, calcium, iron, and folic acid among all participants was 56.4%, 57.8%, 63.3%, and 48.6%, respectively. Among those who have taken these supplements, the percentages were 40%, 24%, 37% and 1% for vitamins, calcium, iron, and folic acid, respectively. Results regarding supplement intake and when it was started are shown in Figure 1. Almost all pregnant women who have taken supplements have done so after pregnancy was confirmed.

Table 1: Socio-demographic description of pregnant women

Variable	Percentage
Age	28.1 ± 5.7
Number of children	3 ± 2.1
Previous pregnancies	3.8 ± 2.4
Number of fetuses	
One	96.8
More	3.2
Educational level	
Elementary	40.8
High school	39.9
University	19.3
Income	
Low	26.6
Moderate	71.1
High	2.3
Place of residence	
Village	70.2
City	24.8
Camp	5
Stage of Pregnancy	
First	6
Second	8.7
Third	67
Unknown	18.3
Haemoglobin level (mg/dL)	4.1
<8	32.1
8-10	42.2
10-12	17.9
>12	

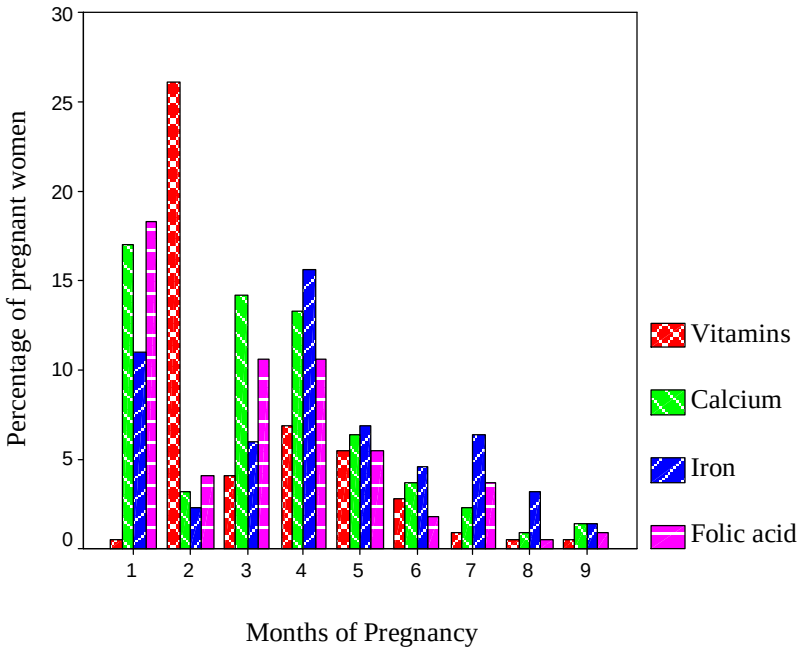

Figure 1: Supplementation intake during pregnancy

Significant correlation was found between age and calcium intake, educational level and iron intake, place of residence and folic acid intake, and finally between monthly income and supplement intake in general.

The stage of pregnancy, as well as parity, had a significant effect on the utilization of calcium. There was no significant difference in the intake of iron, folic acid, or vitamins based on hemoglobin level (Table 2)

Table 2: Level of significance between supplement intake and pregnant women-related varibles.

Variable	Vitamins	Calcium	Iron	Folic acid
Age	0.4	0.047	0.1	0.9
Place of residence	0.5	0.5	0.3	0.002
Education level	0.3	0.7	0.07	0.001
Income level	0.008	0.01	0.04	0.009
Hemoglobin	0.4	0.03	0.7	0.09
Parity	0.2	0.02	0.2	0.3
Stage of Pregnancy	0.5	0.004	0.06	0.5

Most of the pregnant women (63.3%) interviewed had suffered from nausea and vomiting of pregnancy. However, only 26.8% of those women were prescribed medications for treating nausea and vomiting. Main medications used for treating nausea and vomiting were paravomine® or acncozine® (both are local brand names that contain meclizine and pyridoxine). With the exception of supplements, 21.1% of the pregnant women interviewed did not use any drugs at all during the current pregnancy.

Approximately, one third of the pregnant women have taken one or more OTC medication during the current pregnancy. Among the OTC and other self-administered medications, the most common were OTC analgesics and antipyretics (76.8%), followed by medications for the GIT problems (8.5%), and antibiotics (8.5%). The leading reasons for drug use were pain, followed by heart burn, ulcer, and indigestion. Upon data analysis, we found that different age categories had a significant effect on the utilization OTC and other medications that were obtained without prescription. Women of the age category 26-30 years old constituted the group with the highest utilization rate.

As for POM, 56% of the pregnant women have been prescribed a medication during this current pregnancy (prescriptions of medications by dentists were analyzed separately). The major categories of prescribed POM were antibiotics (39.6%), GIT medications (22.6%), POM analgesics (19.5%), decongestants and anti allergic (10.7%), and CVS medications (5.7%). Health conditions for which these POM medications were prescribed were infections, pain, and GI problems. The most common drug classes used (both POM and OTC) by pregnant women are shown in Figure 2.

The average number of medication consumed by pregnant women was 1.6 ± 0.9 medications/woman. Further data analysis revealed that 44.5% of pregnant women have used one medication, 30.8% have used two, and 9.3% have used more than three medications (Figure 3).

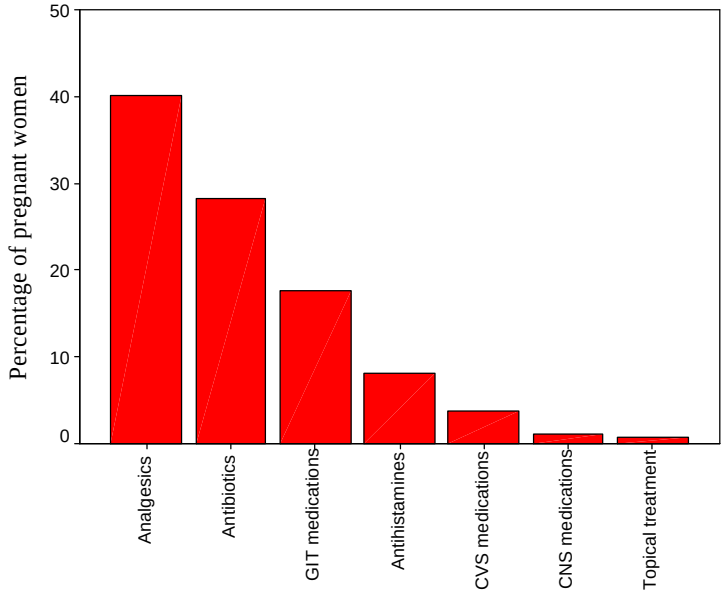

Figure 2: Classes of medications utilized by pregnant women

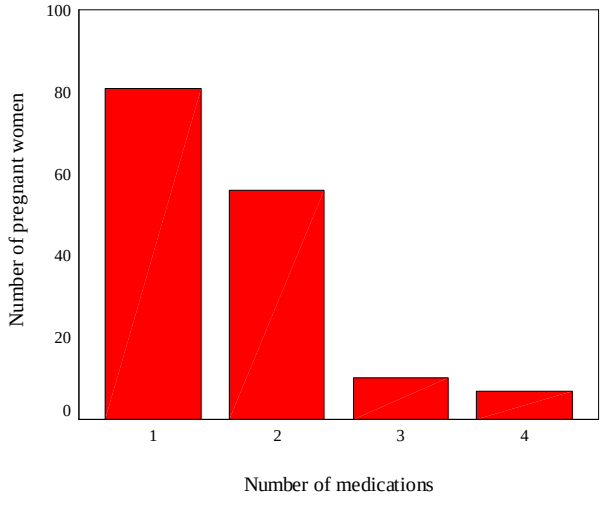

Figure 3: Number of medications utilized by pregnant women

The majority of pregnant women have utilized only one medication. A smaller percentage have used two medications at a time, and a lesser percentage have used three or more.

Regarding the medications that were prescribed to pregnant women, more than 90% of the participants knew the names of their medications. The medications were then classified into the FDA pregnancy drug categories (i.e. A, B, C, D, and X) (Table 3). Some medications were unclassified because they are either not approved by the FDA or they have not been given a category yet.

Table3: Categorization of medications used by pregnant women

A, B, C, D, and X are the FDA categorization of medications in pregnancy based on safety parameters

Category name	Number of medications
A	2
B	21
C	14
D	4
X	0
Unclassified	11

It is important to note that some medications that are marketed and approved in Europe or any other place outside the USA may not have an American approval or classification. An example of such medications will be veniretone, or some local combination of medications such as those in cold remedies or local analgesic creams.

Regarding the use of herbal therapy, it was found that 45.8% of the pregnant women interviewed have used one or more type of herbal therapy. Detailed description is shown below in Figure 4. The major reasons that lead to the utilization of the herbs were abdominal pain (36.1%), anxiety (14.5%), flu (13.3%), and cough (9.6%). Pregnant who used herbal medications did so based on their own decision in most of the cases (55.1%), or based on advice from family and friend (27.6%), or doctors (14.3%).

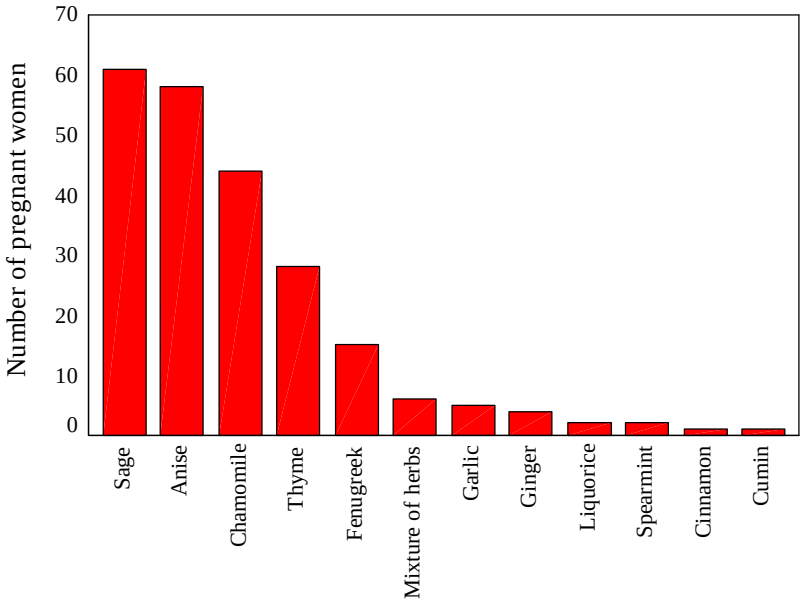

Figure 4: Herbal therapy utilized by pregnant women

Dental hygiene is very important especially during pregnancy. Of the pregnant women interviewed, 79.4% did not visit a dentist during their current pregnancy. Among pregnant women who did visit, a small percentage (10.6%) was prescribed medications. The medications prescribed by dentists to pregnant women were mainly antibiotics. Ibuprofen (category D) was also prescribed to four pregnant women.

Discussion

The pregnant woman may become ill during pregnancy and require drug treatment to protect her life and health as well as the life and health of the fetus. Pregnant women and their physicians frequently have concerns about potential teratogenic and adverse effects of medical treatments. Unfortunately, the information necessary to determine whether treatment with a particular medication during pregnancy poses a teratogenic risk and whether the magnitude of the risk is likely to be greater than the benefit of treatment is often unavailable [16]. A recent study has shown that the risk in human pregnancy was still undetermined for 91.2% of drug treatments approved in the United States between 1980 and 2000 [16].

This current study was conducted to shed a light on medication-utilization among a sample of pregnant women in Palestine. In this study, we found that 81.4% of the women interviewed were anemic. This is a substantial health problem in many developing countries and has been associated with a range of adverse consequences including poor mental development, reduced productivity, maternal mortality, and low birth weight [17]. Unfortunately, pregnant women are not taking iron supplements as they should in order to correct or prevent iron deficiency anaemia and its harmful consequences on both the mother and the fetus.

We found that the majority of pregnant women start taking calcium during the second month of pregnancy. Calcium nutrition may be especially important for women's own bone health and that of their babies. In addition, women who consume more calcium during pregnancy may have higher levels of calcium in their breast milk [18], and babies born to women with higher calcium intake may have better bone mineralization and lower blood pressure in later life [19]. Thus it is important for pregnant women to start taking calcium at the beginning of their pregnancy in order to ensure that they have sufficient calcium stores. The majority of pregnant women have started using folic acid during the second month of pregnancy. This is not in agreement with the current recommendations that advise using folic acid before conception. The role of folic acid in pregnancy has been identified since 1964 by Hibbard [20], and many studies have proven that folic acid decreases the first time incidence, as well as, the reoccurrence of neural tube defects, in addition, folate also decreases the risk of other poor pregnancy outcomes [21-23]. The data indicated that age, education and place of residence were significantly correlated with the consumption of supplementation. A study in Egypt indicated that younger age, higher education, gravidity less than 5, and working outside the home were the factors associated with seeking prenatal care [24]. In Brazil, lower education was among the predictors of not taking a supplement during pregnancy [25]. Another study in the USA that investigated the factors associated with medication intake, it found that lower levels of educational attainment were associated with greater use [26]. Low income correlated with poor supplementation intake because supplements are not covered by the governmental insurance and thus it has to be purchased.

The number of drugs reported in this study was lesser than the actual consumption of medications by pregnant women because some drug categories like supplements were excluded. The results indicated that approximately 80% took medications during pregnancy which is in agreement with a study carried out in a neighboring country [11]. The drugs

reported belong to different therapeutic classes. Pregnant women in studies world wide have used POM and OTC medications in different percentages during their pregnancies [9-11, 26]. In our study, the utilization of OTC was lesser than POM. The results regarding the utilization of POM were matching with the results by Riley *et al*, whereas, the results regarding OTC were similar to those by Splinter [9, 26]. Antibiotics constitute the majority of prescription medications in our study, which is also in agreement with many other studies world wide [7, 11, 26-28] where infections were the leading health problems during pregnancy.

The majority of drugs used by pregnant women in the present study were from category B, followed by category C, unclassified group, and then category D. None belonged to category X. There may be potential risk for the developing fetus from medications specially category C, D, and also the unclassified group. There are reports of use of potentially harmful drugs during pregnancy form other parts of the world [4, 29, 30]. Also, FDA categorization was based on exposure to a single drug at a time, not much is known about the fetal risk when taking two or more medications.

In our study, a large percentage of pregnant women have used herbal medications. Similar studies have found similar results in other parts of the world [12, 31]. Pregnant women have used herbs to treat pregnancy-related or pregnancy-unrelated problems. Pregnant women have reported that they had chosen to take herbs based on their own knowledge, or advice from friends and family. Medical health experts such as physicians, or pharmacists were rarely reported to have advised herbs use. Taking herbal medications without medical consultation constitutes an important health concern given the relative lack of knowledge on the potential side effects of herbs in pregnancy, and the potential interactions with conventional medicines [14, 32, 33]. Pregnant women may choose to use herbal medication because they consider them safer during pregnancy than pharmaceutical products [34]. Some herbs might have side effects and their safety during pregnancy is not yet identified [12, 13, 32]. The widespread use of herbs during pregnancy in our community, and the relative lack of evidence of either efficacy or harm, indicated an increased need that health care providers do ask and document the use and safety of herbal drugs in pregnancy. To meet the needs of pregnant women, it is necessary for health care providers to have knowledge about herbal medications during pregnancy. Regulations ensuring the safety, efficacy, and constituents of herbal therapy need to be set.

Conclusion and Recommendations

Despite the small sample size and the lack of follow up after birth, this study was the first in Palestine to investigate medications, herbal, and supplement utilization among pregnant women. In this study, it was found that supplement intake was not optimum. Women need to be educated regarding the importance of supplements and the potential risk of medications and herbs through all possible methods. It is recommended that drugs be avoided as much as possible during pregnancy. Further research is needed to clarify the safety and effectiveness of these therapies during pregnancy

Pregnant women do utilize different medications and herbs during their pregnancy, some of which might have a potential harmful effect.

Acknowledgment

The author likes to acknowledge the administration and the doctors at Rafedia Governmental hospital specially those working at the prenatal clinic for their continuous support and the permission that they have given us to conduct our study at that clinic. Thanks are extended to the pharmacy students who conducted the interviews.

Clinical relevance:

This is the first paper of its type in the area, no previous studies have been done that investigates the utilization of medication by pregnant women. It adds to the knowledge regarding medication utilization and the policy of having so many drugs over the counter. It also emphasizes on alerting pregnant women to the side effects of drugs.

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