

**PREVALENCE OF USING OVER THE COUNTER DRUGS AND  
HERBAL MEDICATIONS AMONG PREGNANT WOMEN IN  
KHARTOUM STATE - SUDAN**

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**ABSTRACT**

**Background:** Consumption of over the counter (OTC) drugs and herbal medications represents a major concern. This is attributed to the fact that most of the data that highlight proper use of OTC drugs during pregnancy came from observational studies.<sup>[1]</sup> **Aim:** To determine the pattern of using OTC drugs and herbal medicines among

pregnant women attending to some obstetric and gynecologic hospitals in Khartoum state.

**Method:** A cross-sectional survey was conducted in 50 pregnant women, 49 pharmacists and 27 physicians by using questionnaire. **Results:** Sixty six percent of pregnant women

sometimes suffer a complain during the period of pregnancy. Nausea represents 63.3% of complains, being the most common complain. As result of this; pregnant women use different

types of OTC drugs and herbal medications to treat their complains. Forty seven percent of pregnant women consume OTC medicines, while few of them (22.5%) use herbal

medications. They obtain these medications from different sources, 71% percent of pregnant women obtain OTC medications from pharmacies, while 52.9% obtain their herbal

medications from retail shops. This study also reported poor level of knowledge and practice among pharmacists as well as physicians. **Conclusion:** Pharmacists and physicians have poor

knowledge and practice towards the proper use of OTC drugs and herbal medicines. This is due to the fact that they have not received adequate training. Therefore, more educational

strategies and programs should be implemented. In addition, educational campaigns are also needed for pregnant women to ensure proper consumption of OTC drugs and herbal

medications during pregnancy.

**KEYWORDS:** OTC drugs, Herbal medicines and pregnant women.

## INTRODUCTION

### Pregnancy

Consumption of OTC drugs during pregnancy attained large concern for both women and physicians. This is attributed to the potential teratogenic effects of drugs and the physiological changes associated with pregnancy.<sup>[2]</sup>

The physiological changes occurred during pregnancy influence the pharmacokinetic of medications used by pregnant women. During pregnancy, woman's plasma volume increases by 30-50%, cardiac output as well as glomerular filtration rate also increase in similar proportion. These changes led to a lower plasma concentration of some drugs especially those eliminated mainly by kidneys and may result to sub therapeutic drug levels. In addition, body fat is also elevated during pregnancy; which lead to increase in the volume of distribution of fat soluble drugs. Moreover, plasma albumin concentration during pregnancy also decreases, which may result in an increase in the volume of distribution for highly protein bound drugs e.g. anticonvulsants. Furthermore, estrogen and progesterone affect the activity of hepatic enzyme; which can result in drug accumulation or decrease the excretion of some drugs.<sup>[3]</sup>

### Over the Counter Medications

Drugs that are sold directly to the general public without a prescription are defined as OTC drugs. The most common OTC drugs consumed by pregnant women include: antacids, bulking forming laxatives, anti diarrheal agents, cold and allergy remedies and Pain relievers. These drugs are very effective when used appropriately. However, their use can cause serious problems if used incorrectly.<sup>[4]</sup>

### Are prescription drugs harmful to the unborn fetus?

Many drugs consumed by pregnant women can cause a teratogenic effect on fetus. Although the majority of pregnant women use prescribed drugs or OTC drugs, the majority of these medications have not been examined for safety and efficacy. Current data that evaluate teratogenicity of these drugs are obtained mainly from observational studies.<sup>[5]</sup>

Thalidomide is well known teratogenic drug. Thalidomide was widely consumed by pregnant women in the treatment of nausea. In 1960s thalidomide treatment was responsible for severe birth defects in thousands of children.<sup>[6]</sup>

## **Herbal medicine**

Herbal medicines are defined as preparations derived by extraction, fractionation, purification and concentration of herbal materials. Herbal medicines are consumed by approximately 75-80% of the world population and its use is very common in the developing countries.

The most commonly used herbs during pregnancy include chamomile, cranberry, echinacea, ginger, peppermint, castor oil, dandelion, alfalfa, oat and oat straw, nettle leaf, almond oil and green tea.<sup>[7]</sup>

Despite of the limited studies that test the safety and efficacy of herbal medicines, these medicines are still used worldwide to manage health problems occurred in pregnancy. Adverse effects that could be associated with the herbal medicines include toxicity on mothers, development of birth defects in children and increased risk of abortions.

## **METHODOLOGY**

### **Study design**

This study adopted Cross sectional descriptive study design.

### **Study area**

Obstetric and gynecologic hospitals in Khartoum, Bahri and Oumdurman.

### **Study population**

The population of study was pregnant women who delivered at hospital during the study period, pharmacists, as well as doctors.

### **Sampling techniques**

Non probability sampling was used for selecting patients, pharmacists and physicians. The questionnaire was the main tool to collect data from participants.

### **Duration of the Study**

The study was conducted from March 1st 2016 to May 31st 2016.

### **Design, data collection and instrument of study**

In this study; random samples from pregnant women, pharmacists and physicians were collected from obstetric and gynecologic hospitals in locality Khartoum-state. For pregnant

women, data were collected about their socio demographic background, medication use during pregnancy, sources of drug and source of drug information.

### Data analysis

Statistical analysis, the data was analyzed by the using computerized statistical package for Social Sciences (SPSS version 20).

### Ethical Consideration

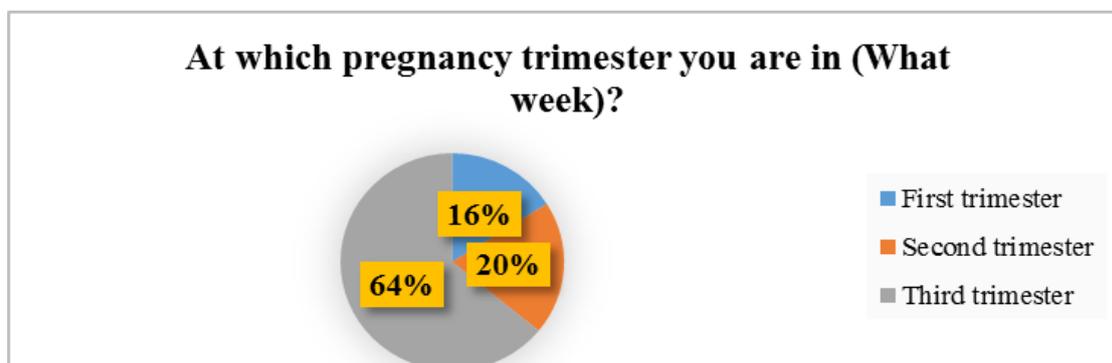
This study was approved by ethical committee at University of Medical Science & Technology (UMST). Permission was obtained before conducting the study from the ethics committee of the university administration. The purpose of the study was explained in details to the participants and confidentiality was ensured.

## RESULTS AND DISCUSSION

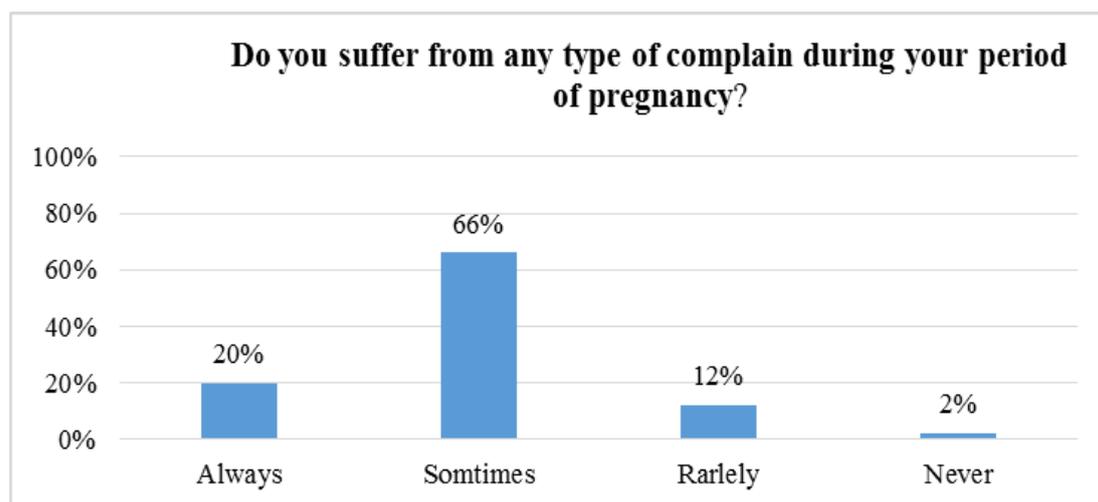
### 4.1: RESULT

**Table 4.1: Demographic characteristics of studied pregnant women (n=50).**

<b>Age</b>	<b>Frequency</b>	<b>percent</b>
(<20)	6	12%
(20-25)	18	36%
(26-30)	12	24%
(>30)	14	28%
<b>Education level</b>		
Illiterate	4	8%
Primary school	4	8%
Secondary school	9	18%
University graduate	29	58%
Higher education	4	8%
<b>Occupation</b>		
Student	10	20%
House wife	25	50%
Health care relates employee	8	16%
other	7	14%
<b>Residence</b>		
Khartoum	26	52%
Urban area other than Khartoum	17	34%
Rural area	7	14%
<b>Parity</b>		
First pregnancy	21	42%
Previous one children	13	26%
Previous more than one children	16	32%



**Figure 4.1: pregnancy Trimester of studied pregnant women (n=50)**



**Figure 4.2: Do you suffer from any type of complain during your period of pregnancy?**

**Table 4.2: Different type of complain that the pregnant women (n=50) suffer from.**

Do you suffer from any type of complain during your period of pregnancy? Specify	Yes	No	Percent
Nausea	31	18	63.3%
Lower back pain	29	20	59.2%
Peptic ulcer	29	20	59.2%
Vomiting	26	23	53.1%
Joints pain	19	30	38.7%
Headache	16	33	32.7%
Constipation	15	34	30.6%
Low limb edema	13	36	26.5%
Fatigue	12	37	24.5%
Diarrhea	9	40	18.4%
Flu	8	41	16.3%
Tonsillitis	6	43	12.2%
Flatulence	6	43	12.2%
Hypotension	5	44	10.2%
Itching	3	46	6.1%
Acne	2	47	4.1%
Fever	2	47	4.1%
<b>Study population = 49 (100%)</b>			

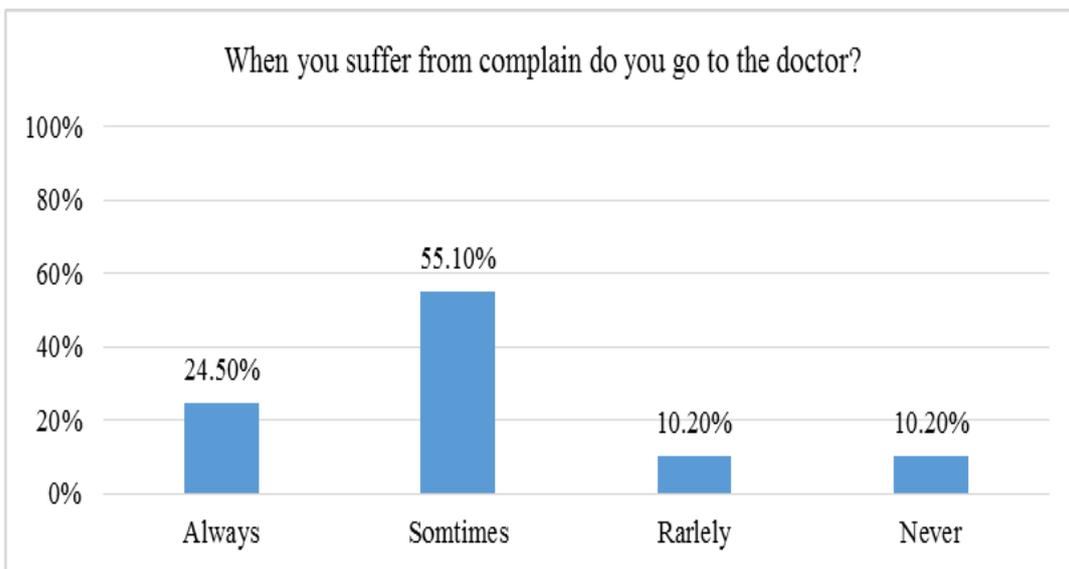


Figure 4.3: When you suffer from complain do you go to the doctor?

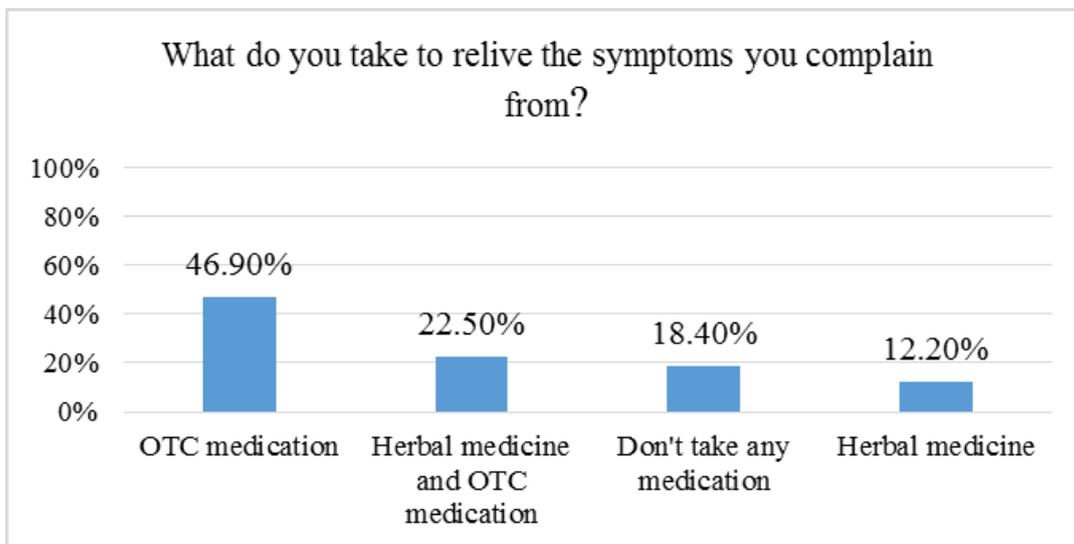


Figure 4.4: What do you take to relive your complaining?

Table 4.3: If you take (OTC drugs) specify.

If you take (OTC drugs) specify	Yes	No	Percent of yes
Vitamin	12	22	35.3%
Vominor	11	23	32.3%
Anti acid	9	27	20.6%
Paracetamol	16	18	47%
Omeprazol	6	28	17.6%
Folic acid	5	29	14.7%
Chorpheniramine	2	32	5.9%
Flagyl	2	32	5.8%
Ibuprfon	1	33	2.9%
<i>Study population = 34 (100%)</i>			

Table 4.4: different type of Herbal medicine used by pregnant women’s (n=50)

If you take herbal medicine, please specify	Yes	No	Percent of yes
Peppermint leaf	8	9	47%
Cinnamon	11	6	64.7%
garlic	4	13	23.5%
Ginger	6	11	35.2%
Castor oil	3	14	17.6%
Chamomile	1	16	5.9
Guava leaf	1	16	5.9
<i>Study population = 17 (100%)</i>			

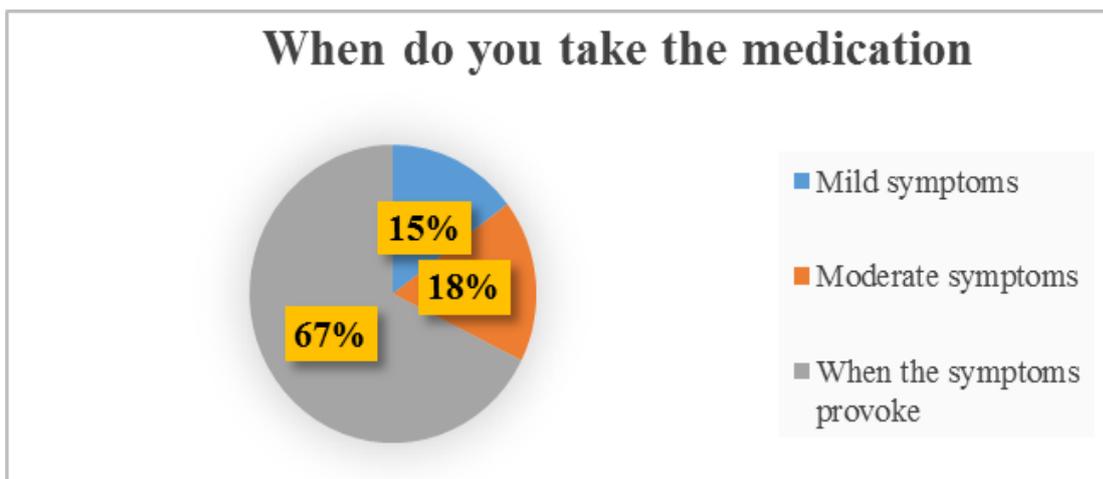


Figure 4.5: when do you take the medication?

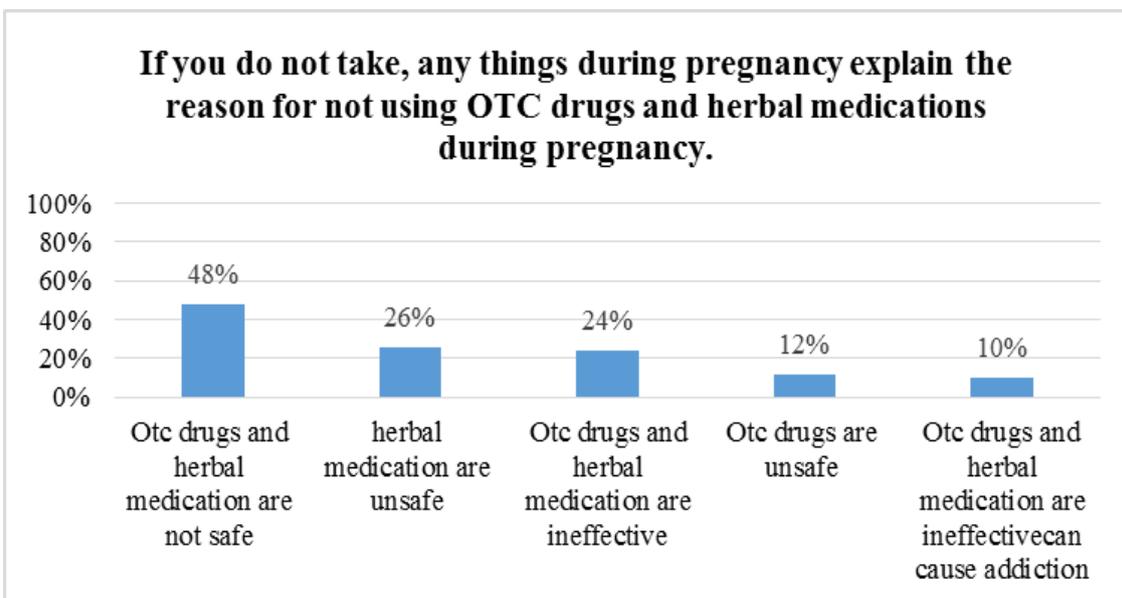
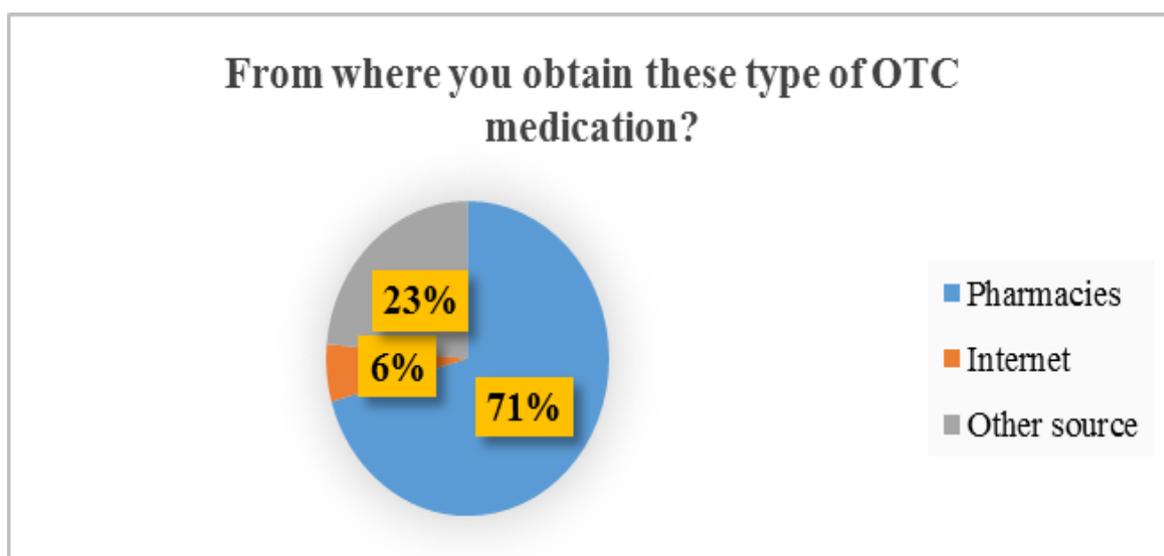


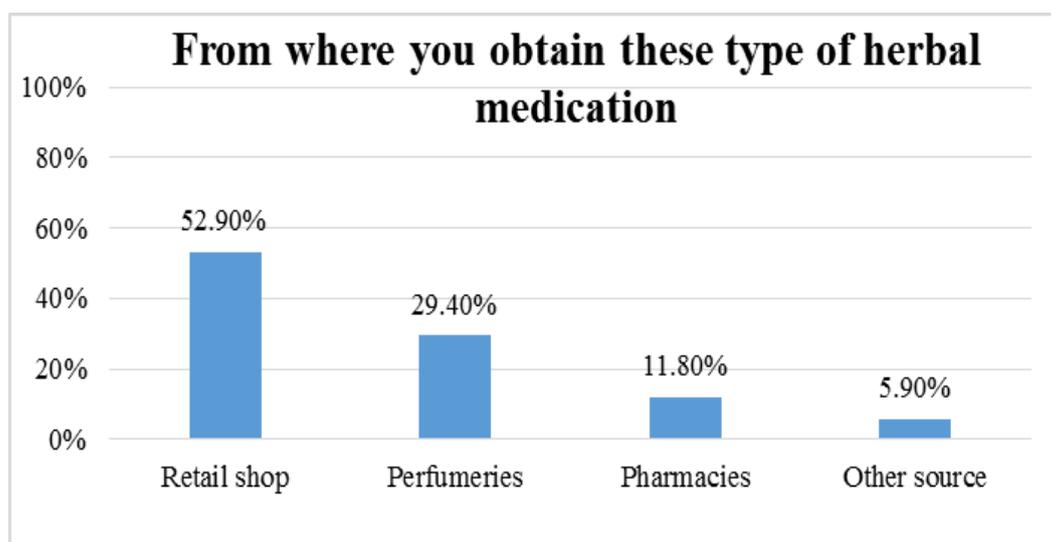
Figure 4.6: If you do not take, any things during pregnancy explain the reason for not using OTC drugs and herbal medications during pregnancy?

**Table 4.5: pregnant women opinion about the counseling provided by physicians and pharmacists to them.**

Practice	Always	Sometimes	Rarely	Never
When you go to pharmacies to obtain OTC drugs, does the pharmacist asks you at which pregnancy trimester you are in?	24	2	1	7
	70.6%	5.9%	2.9%	20.5%
When you go to physician during prescribing, do you think that the physician give you complete information about all aspect of drugs he prescribes to you?	14	18	1	1
	41.2%	52.9%	2.9%	2.9%
When you go to pharmacist, during dispensing does the pharmacist give you complete information about prescribed drugs and how to use them in correct way?	10	16	3	5
	29.4%	47.1%	8.8%	14.7%
If you go to physician, during prescribing does the physician give you complete information about prescribed drugs and how to use them in correct way?	12	9	7	6
	35.2%	26.46%	26.5%	17.6.3%
When using OTC medication: Does it relive the symptoms you complain from?	17	14	1	2
	50%	41.2%	2.9%	5.9%
<b>Study population = 34 (100%)</b>				



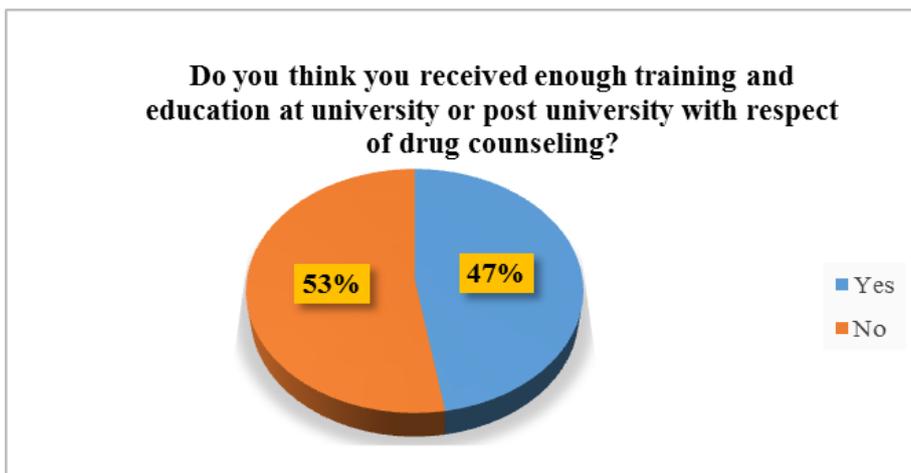
**Figure 4.7: source of OTC medication.**



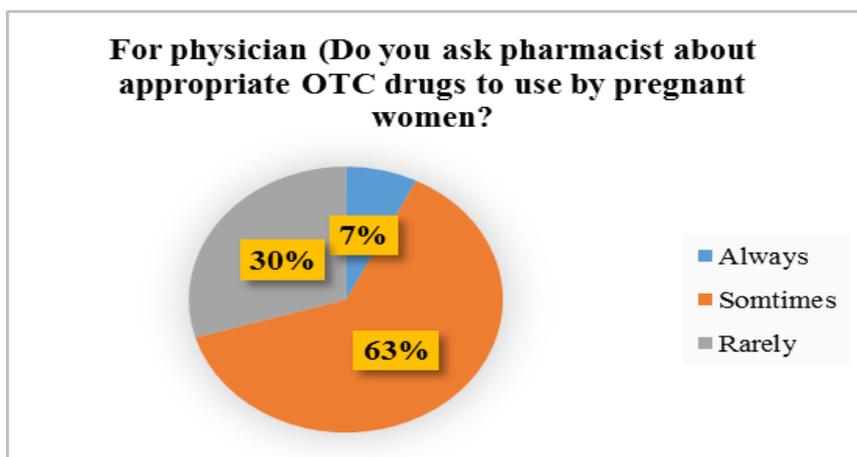
**Figure 4.8: source of herbal medication.**

**Table 4.5: Demographic characteristic for studied pharmacist and physician (n=75)**

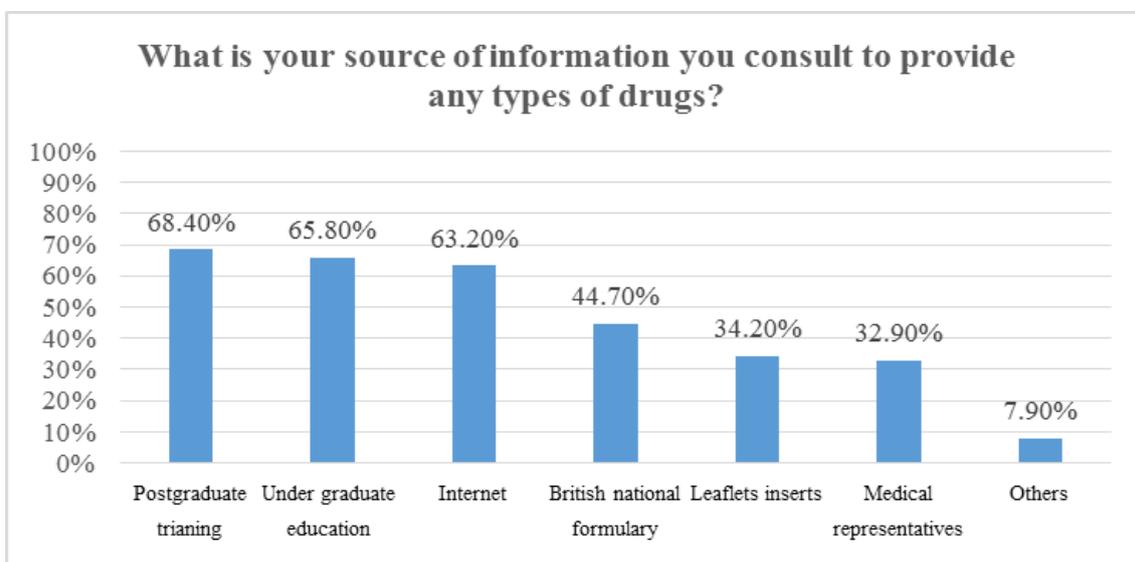
<b>Gender</b>	<b>Frequency</b>	<b>Percent</b>
Male	33	43.4%
female	43	56.6%
<b>Qualification</b>		
Pharmacist	49	64.5%
Physician	27	35.5%
<b>Education level</b>		
BSC	37	48.7%
Msc	10	13.2%
PhD	2	2.6%
Registrar	17	22.4%
Specialist	6	7.95%
Consultant	4	5.35
<b>Experience (Years)</b>		
(<20)	17	22.4%
(1-5)	30	39.5%
(6-10)	15	19.7%
(11-15)	9	11.8%
(16-20)	2	2.6%
(>20)	3	3.9%
<b>Work place</b>		
Community pharmacy	30	39.5%
Hospital pharmacy	19	25%
Public hospital	17	22.4%
Private hospital	5	6.6%
Clinic	5	6.6%



**Figure 4.9: Do you think you received enough training and education at university or Post University with respect of drug counseling?**



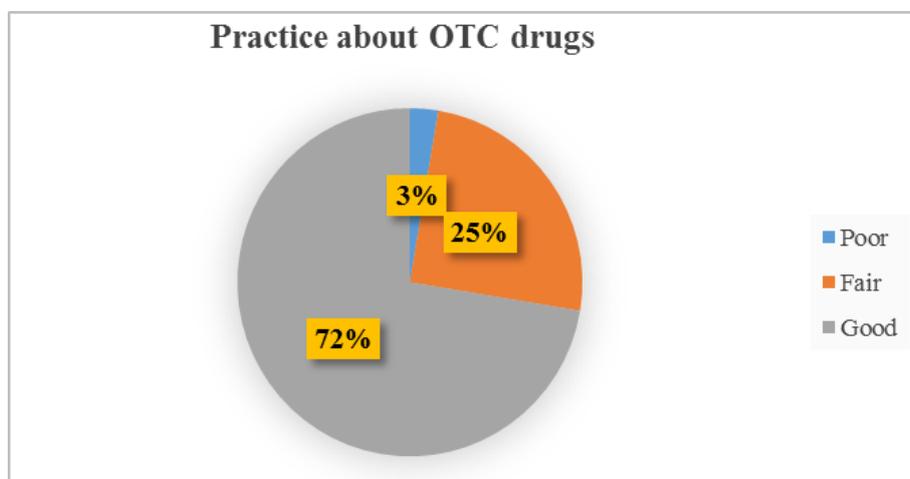
**Figure 4.10: For physician, do you ask pharmacist about appropriate OTC drugs to use by pregnant women?**



**Figure 4.11: what is your source of information you consult to provide any types of drugs?**

**Table 4.7: Pharmacists and physicians attitude towards the use of FDA websites**

General practice	Always	Sometimes	Rarely	Never
Do you consult updated sites created FDA?	9	39	26	2
	11.8%	51.3%	34.2%	2.6%
<i>Study population = 76 (100%)</i>				

**Figure 4.12: Practice of studied pharmacist and physician (n=75) about OTC drugs.****Table 4.8: Practice of studied pharmacist and physician (n=75) about OTC drugs.**

Practice about OTC drugs	Always	Sometimes	Rarely	Never
Do you provide information about OTC drugs regarding proper route of administration?	67	7	1	1
	88.2%	9.2%	1.3%	1.3%
Do you provide information about OTC drugs regarding the possible adverse effects?	37	33	5	1
	48.7%	43.4%	6.6%	1.3%
Do you provide information about OTC drugs regarding drug-drug interaction?	38	28	5	5
	50%	36.8%	6.6%	6.6%
Do you provide information about OTC drugs regarding drug-food interaction?	34	28	7	7
	44.7%	36.8%	9.2%	9.2%
Do you provide information about OTC drugs regarding drug-disease interaction?	39	23	8	6
	51.3%	30.3%	10.5%	7.9%
Do you provide information about OTC drugs regarding? Do you monitor drug adherence and therapeutic outcome?	32	17	14	13
	42.1%	22.4%	18.4%	17.1%
Do you give recommendation about dosage interaction?	47	18	5	6
	61.8%	23.7%	6.6%	7.9%
Do you give recommendation about therapeutic benefit of OTC drug?	54	12	6	4
	71.1%	15.8%	7.9%	5.3%
Do you give recommendation about the step to be taken in case of missed dose?	39	21	11	5
	51.3%	27.6%	14.5%	6.6%
<i>Study population = 76 (100%)</i>				

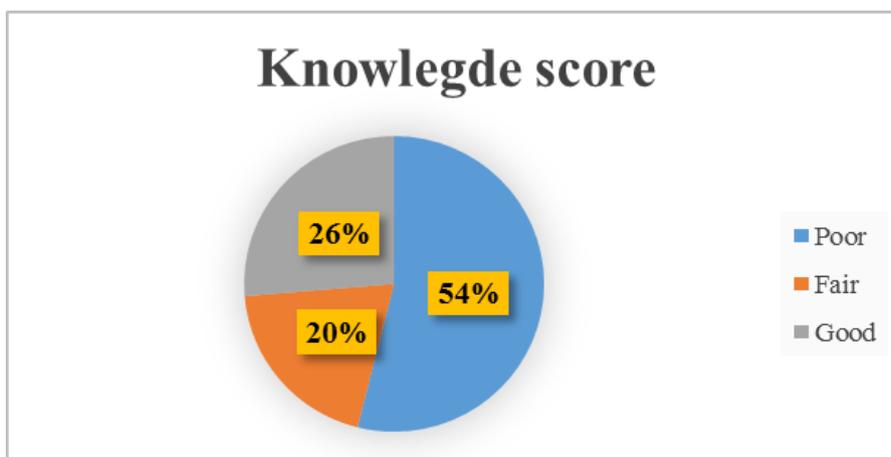


Figure 4.13: Knowledge score of studied pharmacist and physician (n=75)

Table 4.9: Drugs prescribed by pharmacists and physicians for nausea.

Nausea Drugs	Yes	No	Percent of yes
Vomitor	53	23	69.7%
Vitamin B 6	29	49	38.1%
Metochlorpramide	35	41	46%
Meclazine	13	63	17.1%
<i>Study population = 76 (100%)</i>			

Table 4.10: Drugs prescribed by pharmacists and physicians for vomiting.

Vomiting Drugs	Yes	No	Percent of yes
vomitor	60	16	78.9%
vitamin B 6	40	36	52.6%
metchloramid	25	51	32.8%
<i>Study population = 76 (100%)</i>			

Table 4.11: Drugs prescribed by pharmacists and physicians for diarrhea.

Diarrhea drugs	Yes	No	Percent of yes
lopramide	56	20	75.6%
<i>Study population = 76 (100%)</i>			

Table 4.12: Drugs prescribed by pharmacists and physicians for constipation.

Constipation drugs	Yes	No	Percent of yes
laculose	68	8	89.4%
fiber	25	51	32.9%
biscodyl	4	72	5.3%
plus	3	73	3.9%
castor oil	3	73	3.9%
<i>Study population = 76 (100%)</i>			

**Table 4.13: Drugs prescribed by pharmacists and physicians for fever.**

Fever drugs	Yes	No	Percent of yes
paracetamol	76	0	100%
<i>Study population = 76 (100%)</i>			

**Table 4.14: Drugs prescribed by pharmacists and physicians for flu.**

Flu drug	yes	No	percent of yes
vittamin C	18	58	23.7%
loratidine	25	51	32.8%
paracetamol	16	60	21.1%
chloroamphenicol	7	69	9.2%
normal saline	5	71	6.6%
flu tab	2	74	2.6%
citrizine	2	74	2.6%
lozeuges	1	75	1.3%
<i>Study population = 76 (100%)</i>			

**Table 4.15: Drugs prescribed by pharmacists and physicians for cough.**

Cough drug	Yes	No	Percent of yes
balsam	41	35	53.9%
fast	35	41	46.1%
amylin DM	14	62	18.4%
zecough	8	68	10.5%
<i>Study population = 76 (100%)</i>			

**Table 4.16: Drugs prescribed by of selected studied group (n=75) for cold.**

Cold drug	Yes	No	Percent of yes
vitmin c	24	52	31.6%
streplis	16	60	21.1%
paracetamol	30	46	39.4%
lozenger	4	72	5.3%
loratidine	6	70	7.8%
flu tab	2	74	2.6%
chlorampheniramine	4	72	5.2%
pseudoepheerine	1	75	1.3%
<i>Study population = 76 (100%)</i>			

**Table 4.17: Drugs prescribed by pharmacists and physicians for Rash.**

Rash drugs	Yes	No	Percent of yes
loratidine	8	68	10.5%
cetirizine	9	67	11.8%
chlropheniramine	41	35	53.9%
paracetamol	2	74	2.6%
<i>Study population = 76 (100%)</i>			

**Table 4.18: Drugs prescribed by pharmacists and physicians for headache.**

Headache	Yes	No	Percent of yes
paracetamol	76	0	100%
<i>Study population = 76 (100%)</i>			

**Table 4.19: Drugs prescribed by pharmacists and physicians for indigestion.**

Indigestion drug	Yes	No	Percent of yes
zymogen	46	30	60.5%
eno	21	55	27.6%
samith cone	15	62	18.4%
Digestive enzyme combination	5	71	6.5%
<i>Study population = 76 (100%)</i>			

**Table 4.20: Drugs prescribed by pharmacists and physicians for itching.**

Itching drug	Yes	No	Percent of yes
calamine lotion	30	46	39.5%
loratidine	14	62	18.4%
citrizine	6	70	7.8%
chlorpheniramine	6	70	27.8%
<i>Study population = 76 (100%)</i>			

**Table 4.21: Drugs prescribed by pharmacists and physicians for acne.**

Acne drug	Yes	No	Percent of yes
acne soap	39	37	51.3%
calamine lotion	2	74	2.6%
clindamycin solution	2	74	2.6%
<i>Study population = 76 (100%)</i>			

**Table 4.22: Drugs prescribed by pharmacists and physicians for flatulence.**

Flatulence	Yes	No	Percent of yes
gasix	16	60	21.1%
Eue carbon	23	63	30.2%
<i>Study population = 76 (100%)</i>			

**Table 4.23: Drugs prescribed by pharmacists and physicians for lower back pain.**

Lower back drug	Yes	No	Percent of yes
moov cream	51	25	67.1%
paracetamol	46	30	60.5%
diclofenac Na	6	70	7.9%
<i>Study population = 76 (100%)</i>			

**Table 4.24: Drugs prescribed by pharmacists and physicians for peptic ulcer.**

Peptic ulcer drug	Yes	No	Percent of yes
anti acid	43	33	56.6%
rantidine	20	56	26.3%
omeprazol	37	39	48.6%
<i>Study population = 76 (100%)</i>			

**Table 4.25: Drugs prescribed by pharmacists and physicians for anemia**

Anemia drug	Yes	No	Percent of yes
vitaferrol	42	34	55.3%
vitamin	41	35	53.9%
ferrous	14	62	18.4%
folic acid	7	69	9.2%
<i>Study population = 76 (100%)</i>			

## DISCUSSION

Pregnancy is special physiological state where drug use attained special concern as the physiology of pregnancy can alter the pharmacokinetic of treatment and certain medications can induce teratogenic effect.<sup>[8]</sup> As pregnant women may suffer from complains during pregnancy and require treatment, health care providers often have concerns about the potential teratogenic and adverse effect induced by medications.

Fifty pregnant women of different ages participated in this study as shown in table (4.1), most of them aged between 20-25years. 52% of participants live in Khartoum state, the rest were from different areas rather than Khartoum state.

The results showed that about 66% of pregnant women suffer sometimes from specific type of complain during pregnancy and about 20% always suffer from complain. This is due to physiological changes that occur normally during pregnancy. The different types of complains that may occur during pregnancy are expressed in table (4.2). Nausea was found to be the most frequent complain in 63.3% of participants. This explain the reason of using OTC drugs and herbal medications by pregnant women in order to relive their complain. The study found that about 46.9% of pregnant women use OTC medications and about 12.2% of them use herbal medications. These results were found to be similar to previous study that conducted in Hispanic pregnant women in order to investigate the use of herbs, OTC medications and vitamins during pregnancy. The results observed that 19% of precipitants took herbs, while 47% of them took OTC medications to relive their complains.<sup>[9]</sup>

About 4.6% of pregnant women who use OTC medications said that they only take this medication when their symptoms provoke.

It is estimated that up to 55% of pregnant women sometimes visit the doctors when they suffer from complain. This reflects a good practice, and will ensure that they will not take unnecessary medications by them self, and thus, maintain safe pregnancy.

Results in table no (4.3) indicate that paracetamol is being the most commonly used drug among pregnant women to control symptoms like (pain, fever and other symptoms). Other drugs used by pregnant women in table no (4.3) are considered being safe during pregnancy. Most of OTC drugs used by pregnant women are of category (B), this include (Ibuprofen, Ranitidine, Choramphniramine, Anti-acid.<sup>[10]</sup> Omeprazole (proton pump inhibitor) used for ulcer is of category (C) which should be used with caution if benefits outweigh risks.<sup>[11]</sup> These drugs are widely used during pregnancy. These results are similar to previous study conducted to examine the most commonly used OTC drugs among pregnant women.<sup>[12]</sup>

There is a limited data that address safety and efficacy of herbal medicines during pregnancy. Previous study was done about the use of herbal treatments during pregnancy. The study evaluated the use of antenatal herbal and natural product among mothers of non malformed infants in five geographic centers. The study revealed that five percent of 4,866 mothers of non malformed infant used herbal medicines during pregnancy.<sup>[13]</sup> Another study conducted on Australia to assess the safety of herbal medicine reported that the adverse effects induced by these products resulted from presence of heavy metals in herbal products and prescription drugs in overdose.<sup>[14]</sup> Thus, the use of herbal medicine should be conducted under supervision of health care providers to avoid serious complications that may caused by them.

In table no (4.4), about 17.6% of pregnant women use castor oil as herbal medicine. Castor oil is of category (X), thus, this drug should be avoided during pregnancy due to its teratogenic effect.<sup>[15]</sup> Therefore, pregnant women should be advised regarding this issue, in order to limit the use of such product during pregnancy. In addition, 5.9% of pregnant women use chamomile. Chamomile usage is associated with a higher incidence of abortions and preterm labors.<sup>[16]</sup>

Pregnant women were asked some questions regarding the practice of pharmacists and physicians in respect to OTC medications that provided to them, to see if they provide them

proper counseling. 41.2% of them said that the physician sometimes give them complete information about all aspect of OTC medication, while 29.4% said that the pharmacist always gives them complete information about all aspect of OTC medication. This reflects good practice and knowledge from physicians regarding providing complete information about all aspect of OTC medication to pregnant rather than pharmacist.

The figure no (4.7) and figure no (4.8) showed the different sources for obtaining OTC and herbal medication by pregnant women. Fortunately, most of pregnant women obtain OTC medication from pharmacies (70.6%) and this reflects a good practice and well knowledge of them because this source is under the supervision of pharmacist. This may ensure that most of pregnant women will use correct treatment and will receive proper counseling provided by pharmacists.

Pharmacists and physicians were also involved in this study to examine their practice and knowledge about OTC medication. About 52% of pharmacists and physicians think that they have not received enough training and education at University or Post University with respect of drug counseling for pregnant women. This fact represents a major concern as proper usage of OTC drugs by pregnant women relies on counseling provided by health care providers.

Figure (4.13) explained the source of information used by physicians and pharmacists to provide these drugs. 68% of physicians and pharmacists obtained their knowledge from postgraduate training, while while 65% obtained their knowledge from university, 63% from internet, 34% from leaflet inserts and 32% from medical representatives. Medical representatives also affect consumption of OTC drugs, as the medical representatives tend to increase their sales by influencing physicians and pharmacists to prescribe and dispense their target drugs. Similarly, information provided by websites available in the internet are not reliable as many of these information lack proper referencing.

General practice of pharmacists and physicians is explained in table no (4.6). Only 11.8% of them always keep visiting updated sites created by FDA for drug used by pregnant women. This may explain their poor knowledge and practice they provide. They should visit such site regularly in order to update their information and knowledge about the medication. This website is regularly updated by FDA authority.

Ninety three percent of physicians and pharmacists always ask pregnant women at which pregnancy trimester they are in. While 67% of them ask pregnant women about other drugs consumed by them. Only 14.5% of them ask pregnant women about herbal medication. This is important in order to prescribe any type of medication, to see if the medication will act in the correct way and to avoid any possibility of drug and drug interactions as well as adverse drug reactions. About 68.4% of pharmacists and physicians said that they provide counseling with respect of OTC drug.

Physicians were asked whether they refer to pharmacists while prescribing any type OTC medication to pregnant women, only 63% of them said that they sometimes refer to them. This is considered as a poor practice from them regarding this aspect, as the physicians should always take pharmacist's opinion when prescribing such a drugs. This because pharmacist is more related to drugs in aspect of knowing better information regarding how the drug will act, possible adverse effect, correct dose to be taken according to patient specific factors. Both of them will work to provide the correct drug.

Figure no (4.12) evaluates the practice of pharmacists and physicians about OTC drugs. Health care providers were asked whether they provide information about OTC medication regarding proper route of administration, possible adverse effect, possibility of drug-drug interaction, drug food interaction, how drug will act to eradicate complain, whether they monitor adherence of patient to therapy and what action to be taken in case of missed dose. All of the above questions are important to ensure that the drug will act in correct and safe way with a little toxic or adverse effect on both fetus or pregnant women.

Figure no (4.13) indicates that total knowledge score for pharmacists and physicians is considered being poor. Thus, a lot of attention should be put in this aspect, in order to improve the practice and knowledge of pharmacists and physicians.

Pharmacists and physicians were asked about the different types of drugs that they prescribe to pregnant women. The majority of drugs which were prescribed by physicians and pharmacists to pregnant women are from category A and B which is considered safe to be used during pregnancy. Few of them are from category C, eg diclofenac sodium for lower back pain. This drug should be avoided during late pregnancy as it may cause premature closure of ducts arteriosus.<sup>[17]</sup> On the other hand, pseudoephedrine reduce uterine blood flow and cause elevation in maternal blood pressure.<sup>[10]</sup> Therefore, Usage of these drugs should be

restricted during pregnancy as there are many alternative drugs which are safer and more effective.

About 9.3% of pharmacists and physicians prescribe castor oil to pregnant women for constipation. This represents a serious problem, because castor oil belongs to category (X) and should be avoided during pregnancy.

Poor practice or knowledge score is being a big problem, as pharmacists and physicians should always provide proper counseling, complete information, and do monitor the treatment in order to ensure that the treatment will not produce any serious side effect and hence maintain safe pregnancy.

### **CONCLUSION**

A great number of pregnant women consume OTC drugs and herbal medicines during their period of pregnancy in order to relieve their specific pregnancy related complain. Pharmacists and physicians have poor knowledge and practice towards proper handling of OTC drugs and herbal medicines. This is due to the fact that they have not received adequate training. Thus, more educational strategies and programs should be implanted to ensure proper handling with these medications.

In addition, educational campaigns are needed as well for pregnant women to ensure proper consumption of OTC drugs and herbal medications during pregnancy.

### **RECOMMENDATION**

Educational programs for pregnant women, pharmacists and physicians should be offered on regular basis through variety of methods such as media, website, at hospitals, workshops and other methods.

This study was conducted in Khartoum state, so more studies are needed in rural areas. In addition, more studies are needed with larger sample size in order to generalize results.

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