

### 3. RESULTS

#### Demographics

A total 43 questionnaires were distributed to pharmacists in North Cyprus. All questionnaires were filled and returned, giving a response rate of 100%. 20.0% were males while 80.0% were females. The median age was 34.5 years (range: 21-48), with the predominant age group between 20 and 29 years, followed by 30 to 39 years. With respect to educational levels in pharmacy practice, the principal group was Bachelor degree in pharmacy (56.0%). The pharmacists who participated in this study had a wide range of experience in practice, ranging from one year up to 25 years, many of whom graduated from Turkey (49.0%).

**Table 3: Demographics (n = 43)**

Characteristics		Respondents ( %)	
Sex	Male	20.0	(9)
	Female	79.0	(34)
Age group			
	20-29 years old	60.0	(26)
	30-39 years old	21.0	(9)
	40-49 years old	19.0	(8)
Years of experience			
	1-5	44.0	(19)
	6-10	16.0	( 7)
	11-15	9.0	(4)
	16-20	7.0	(3)
	21-25	23.0	(10)
Location of faculty, which pharmacist graduated			
	Cyprus	21.0	(9)
	Turkey	49.0	(21)
	Others	30.0	(13)
Level of education			
	Bachelor	56.0	(24)
	Masters	28.0	(12)
	PhD	7.0	(3)
	Others	8.0	(4)

### Pharmacists' Source of Information

Pharmacists know how to source medical information, with vast majority (42.0%) consulting the Rx media platforms and 37% consults physicians, The use of Wikipedia was (2.0%), but is not recommended for medical purpose.

**Table 4: Pharmacists' Source of Information**

Source of information	% number of participant
Wikipedia	2.0 ( 1 )
Medical doctor	37.0 (16)***
Rx media	42.0 (18)***
Pharmacist	12.0 (5)
Others	7.0 (3)

\*\*\*P<0.0001, statistically significant when compared to other information source

### Pharmacists counseling pregnant women

Young pharmacists 1-10 years of experience have high percentage of pregnancy counseling of 56.0%, while pharmacists from 11 years of experience and more reported 26.0% of pregnancy counseling, whereas 19.0% pharmacists had never counsel pregnant women. Pregnant women are in need of adequate information from health care professionals. In a recent study, 57% of the women reported a need for information about medicines during pregnancy, (73%) consulted physicians, (60%) used the internet and (46%) consulted the pharmacist (Hameen-Anttila et al, 2013). Counseling of pregnant women by pharmacist should be encouraged because they have good knowledge on rationale drug use.

**Table 5: Pharmacists counseling pregnant women**

Number of counseling on pregnancy	% number of participants
None	19.0 ( 8)
1-5	35.0 (15)****
6-10	21.0 (9)
11-20	5.0 (2)
21 & above	21.0 (9)

\*\*\*\***P<0.0001**, statistically significant when compared with other group

### **General knowledge of pharmacists during pregnancy counselling**

Briggs et al on 2002 showed that there is significant risk of spontaneous abortion and risk of many significant anomalies on the use of all vitamins without prescription during pregnancy (Briggs GG et al, 2002). The pharmacists reported good response in the use of vitamins during pregnancy with 98.0% of the pharmacists being aware of the danger of giving vitamin without prescription. 91.0% can recommend paracetamol during pregnancy. Hoff GL et al 2005 reported that aspirin use during pregnancy is associated with prolonged gestation and decreased body weight (Hoff GL et al 2005). 96.0% of the pharmacist will not recommend aspirin for use during pregnancy. A study has shown that prevalence of herbal dietary supplements use in pregnancy ranged from 4.3% in Sweden to 69% in Russia (Kennedy et al 2015). With the exception of ginger, there is no data to support the use of any other herbal supplement during pregnancy (Dante G et al, 2013). 9% of the pharmacists initially agreed on the use of herbal product during pregnancy, after education it decreased to 3% showing the need for continuing education.

A recent meta-analysis which involves 2398 pregnant women which was exposed to H<sub>2</sub>RAs in at least the first trimester, compared with 119 892 women in the control group showed an odds ratio (i.e. the measure of the association between exposure and outcomes) of 1.14 for congenital malformation. There was no difference in risk of spontaneous abortion or preterm delivery between the exposed women and the control group, (Gill SK et al 2008). Initially 54% of the pharmacist agreed that heartburn can be treated with H<sub>2</sub>RAs, life modifications and antacids, which later increased to 93% after education. Antacids which contain aluminum, calcium, and magnesium were not teratogenic in animal studies and are recommended as first-line treatment of heartburn and acid reflux during pregnancy, (Mahadevan U et al 2006).

The FDA category did not give clear information on drug use and also did not give specific information on individual patients, 30.0% showed positive response before education and after education it increased to 77%, this demonstrated the need for continuing education among pharmacist. Before education about 67.0% pharmacists agreed on vitamins containing harmful substances and therefore should be used only when prescribed, but after education it increased to 90%, portraying the need for continuing education among pharmacist.

Grabenstein JD,1998 reported that pharmacists are vaccine advocate and also help to facilitate immunization around the community (Grabenstein JD 1998) . Flu vaccination is advisable during pregnancy, Before education 26.0% of the pharmacist agreed on the need for recommendation of vaccine during pregnancy, after education it increased to 88% , showing the importance of continuing education among pharmacists.

**Table 6: General knowledge of pharmacists during pregnancy counselling**

	Before education			After education		
	Correct (%)	Incorrect (%)	Neutral (%)	Correct (%)	Incorrect (%)	Neutral (%)
A pregnant woman takes all vitamin supplements without prescription <b>(False)</b>	98.	0	2.0	95	3.0	3.0
Aspirin can be recommended by a pharmacist to pregnant woman who has headache and pain <b>(False)</b>	95.0	2.0	2.0	100	0	0
Paracetamol can be recommended by a pharmacist to pregnant woman who suffers headache and pain <b>(True)</b>	91.0	9.0	0	93.0	8.0	0
The FDA pregnancy category gives clear information about drugs and it also gives specific information about the patients <b>(False)</b>	<b>30.0</b>	54.0	16.0	<b>77.0****</b>	23.0	0
Herbal products should be preferred by pregnant woman as they are natural	84.0	9.0	7.0	93.0	3.0	5.0

and safer. <b>(False)</b>						
Flu vaccination should be recommended by pharmacist for pregnant woman in flu season (October-March). <b>(True)</b>	<b>26.0%</b>	49.0	26.0	<b>88.0****</b>	13.0	0
Vitamins and other supplements may contain toxic material, which is not shown in their label. <b>(True)</b>	<b>67.0</b>	9.0	23.0%	<b>90***</b>	8.0%	3.0%
Life style changes, antacids and H2 blockers can be recommended to pregnant woman who suffers heartburn. <b>(True)</b>	<b>54.0</b>	33.0	14	<b>93.0****</b>	8.0	0

\*\*\*\*P<0.0001, \*\*\*P<0.001, statistically significant when compared before education.

#### 4. DISCUSSION

This study is the first study conducted in Northern Cyprus, with the main objective of exploring the knowledge of pharmacists towards counseling of pregnant women, and also to know the impact of education on pharmacists.

The role of the pharmacist in counselling of pregnant women cannot be over emphasized, this is because, the pharmacist has been responsible for provision of pharmaceutical care in patients including pregnant women. Some of this functions includes; by collaborating with the clinicians in providing obstetric care, pharmacist can offer life style modification, self-monitoring of blood glucose and drug therapy (US Pharm 2014). And also with legislation by allowing the pharmacists to administer vaccines, pharmacists are key providers of immunizations. Vaccines play an important role in pregnancy and preconception health (Skelton JB 2011).

In this study it was observed that there is a great need for continuing education among the pharmacist, due to the significant changes which was observed after education. In the treatment of heartburn using H<sub>2</sub>RAs, life modifications and antacids, positive response increased from 54% to 93% after education of pharmacist. Antacid are use in the treatment of heartburn and acid reflux during pregnancy (Mahadevan U et al 2006). Go, et al also reported that life modification by avoiding food that activates the oesophageal valve like chocolates and fatty food helps to reduce heartburn (Go et al 2013). Also after pharmacist education the knowledge about the use of vaccine during pregnancy increased from 26% to 88% showing a good response for continuing education, pharmacists are vaccine advocate and also help to facilitate immunization around the community (Grabenstein JD 1998). Continuing education of pharmacists on the dangers of not vaccinating a pregnant women during pregnancy is invaluable and should be encouraged, also they should be able to know which exact vaccines to be used. Live vaccines are

not to be used during pregnancy because there is a possibility of transferring the disease to the mother or baby. Live vaccine can only be given when the likelihood of the disease exposure is high or when the infection would pose serious risk to the mother or baby (CDC.GOV 2016).

The FDA pregnancy category does not give clear information about drug and also it does not give specific information about individual patients. Before the pharmacist education only 30.3% of the pharmacists were aware of this problem, but was increase to 77% after education showing that pharmacists education was a success and is necessary to be encouraged. FDA is still considering a new classification that can cover this aspect till date.

However we observed that the majority of the pharmacists were aware of the danger of using vitamins without prescriptions as 98.0% of the pharmacist agreed that vitamins must be prescribed before it can be used during pregnancy, for example, vitamin A is not recommended for use during pregnancy this is due to high incidence of congenital marformation (NICE, 2008). Furthermore pharmacist should know that some vitamins can be recommended for use during pregnancy, for example folic acid has proven to be safe and is encouraged to be used anytime during pregnancy. A daily supplement of folic acid 400 micrograms (400µg/0.4mg) given before conception and during the first 12 weeks of pregnancy helps to prevent neural tube defects (NTD's) (FSAI, 2006). Women who have a family history of NTDs or pre-existing diabetes should be on a higher dose of folic acid before conception up to 12 weeks gestation (HSE 2010). This is because folic acid helps to avert NTDs when taken at high-dose levels but should not be more than 1000 micrograms per day.

Before education we also observed that 95.0% of the pharmacists were aware of the dangers associated with aspirin use during pregnancy, Aspirin is under pregnancy category D drug in FDA classification, hence proven teratogenic and should be avoided during pregnancy. Aspirin



can cause internal bleeding because it can act as anti-platelets. The use of aspirin in pregnancy is proven to cause neonatal hemorrhage and some other pregnancy complications, including prolonged gestation and decreased birthweight (Hoff GL et al 2005). Pharmacists are still encouraged to enhance their knowledge in this regard in order to maximise better patients health outcomes.

Finally, before education we also observed that about (83.7%) of the pharmacists know that herbal products are not safe for use during pregnancy, most of these products contain pesticides and are teratogenic (Braun L et al 2010). Herbal products should not be recommended for use during pregnancy basically due to lack of evidence for use, till date FDA has not given any classification on the use of herbal drugs during pregnancy, precisely due to lack of data.

Pharmacist as a health care professional who is acquainted with skills in rationale drug use should be able to make a proper recommendation of drug therapy during pregnancy, thus their constant education is mandatory. Wikipedia use must completely be avoided during medication, because information in Wikipedia can be edited.

Generally in this study pharmacists showed some good response to the questions, but a lifelong education of the pharmacist should be supported, so that their knowledge of drug will be continually updated.