Knowledge and Beliefs regarding Seasonal Influenza Vaccine among Pregnant Women Attending Antenatal Clinics.

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Abstract

Background: Seasonal influenza during pregnancy is a potentially life-threatening illness. It is associated with an increased risk for both mother and fetus, as; respiratory and cardio-pulmonary hospitalization, pre-term delivery, fetal distress, and death**. The current study aims** to assess knowledge and beliefs regarding seasonal influenza vaccine among pregnant women attending antenatal clinics. **Methods:** A descriptive correlational research design was adopted for this study to achieve the study aim. **Tool**: Three tools were used to collect the data; 1) structured interviewing questionnaire schedule, 2) seasonal Influenza knowledge assessment tool, and 3) influenza vaccine beliefs scale. **Sample:** A purposive of 160 pregnant women was enrolled in the study. **Setting:** the study was conducted at the outpatient antenatal clinics, maternity hospital, Cairo University, Egypt. **Results:** The mean age of the study sample was 29.98 ± 6.107 years. About 45.6% of them had primary and secondary education with more than half of the study sample were working (51.9%). More than half of the study sample (51.9%) had a sufficient level of knowledge with a positive beliefs regarding seasonal influenza vaccine during pregnancy. The barrier of pregnant women not taking the vaccine was; expensive; women not welling and fears from safety of the vaccine. **Conclusions:** Pregnant women had a sufficient level of knowledge and positive beliefs regarding influenza vaccination during pregnancy. **Recommendations:** These findings are important in tailoring educational programs and addressing the training needs of increase awareness regarding seasonal influenza during pregnancy for all women attending outpatient clinics. Also, the obstetricians should be highlighted the need for a national policy for the use of vaccines during pregnancy.

Keywords: Influenza, pregnant women & Vaccine

Introduction

Influenza (flu) is a highly contagious respiratory viral infection and major global public health concern that infect all age groups. However, pregnant women, children, elderly, and people with chronic health conditions are especially vulnerable to influenza complications. It is associated with serious illness, increased hospitalizations, and death (**Dawood et al, 2021**), and can also negatively impact economic conditions in affected areas (**Kamimura et al., 2017; Keilman, 2019).** Influenza is more likely to cause serious illness in pregnant and postpartum women than in nonpregnant women. Pregnancy-related changes in the immune system, heart, and lungs make pregnant women more vulnerable to severe influenza illness (**Centers for Disease Control and Prevention (CDC), 2019**). Pregnant women are at a higher risk of developing severe influenza symptoms due to pregnancy related immunological and physiological changes. The risk of influenza related complications is higher for pregnant women who have multiple chronic health conditions as asthma, diabetes mellitus, and chronic cardiac disease compared to women who have just one or none of these conditions (**Somerville et al., 2018).**

Pregnancy is an immune-suppressed state that poses an increased risk of infections as; influenza among pregnant women. Several established organizations including the Centers for Disease Control and Prevention (**CDC, 2010**), the American College of Obstetricians and Gynecologists (**ACOG, 2013**) recommended that all women who are pregnant should be vaccinated during influenza season. Despite existing recommendations and data on the effectiveness and safety of the vaccine, the influenza vaccine is underused in most countries including Egypt. In addition, influenza can be lead to dangerous complications to the fetus such as an increased rate of neonatal intensive care unit admission, increased rates of stillbirth, and preterm birth (**Vishram et al., 2018**). There are two formulations of influenza vaccine uptake, an injectable inactivated vaccine, and a live attenuated intranasal spray. The injectable vaccine is the only form recommended for pregnant women (**American College of Obstetricians and Gynecologists (ACOG), 2018**).

Moreover, women who are not pregnant but are breastfeeding can receive either form of the flu vaccine (**Center for Disease Control and Prevention, 2010, Vishram et al., 2018**).

The **CDC (2019) & ACOG (2018)** have both recommended that all pregnant women in any trimester receive routine influenza vaccination to decrease the risk of severe influenza and vaccine is considered safe for both the mother and the fetus as well as it also protects the fetus by lowering the risk of low birth weight (**Vishram et al., 2018 & Wang, et al., 2019**). Although there is no evidence of pregnancy complications or adverse fetal outcomes from maternal influenza vaccine, the low uptake of vaccine during pregnancy might be related to lack of vaccine acceptance by pregnant women, as well as, barriers among health care providers including lack of confidence about vaccine safety and benefits (Panda **et al., 2011**). Also, antenatal care providers are more likely to recommend the influenza vaccine to pregnant women increase awareness about influenza vaccination during pregnancy as well as, giving positive attitudes towards influenza vaccination during pregnancy (**Ding, et al., 2017**). Moreover, discussion with pregnant women regarding the effects of influenza and the potential benefits of vaccination during pregnancy is particularly important because a lack of knowledge about the benefits of the influenza vaccine has been shown to be a barrier to vaccine acceptance (**Beigi, et al., 2009**). Moreover, studies consistently suggest that when recommendations for influenza vaccination during pregnancy come directly from a woman's obstetrician-gynecologist or other obstetric care provider and the vaccine is available in the physician's office, the odds of vaccine acceptance and receipt are 5-fold to 50-fold higher (Shavell et al., 2012). Therefore, the present study contributes to a greater understanding to assess pregnant women's knowledge and beliefs towards seasonal influenza vaccine during pregnancy.

Significance of the study

There has been little focus on common preventable infectious diseases, as seasonal influenza that can harm fetal development by causing inflammation in pregnant mothers (**Napolitano et al., 2017**). Influenza is a virus that mutates as it spreads around the world, causing previously acquired immunity to be largely lost. This result in annual outbreaks of seasonal influenza during the winter months, infecting 5–20% of the population (**Steinhoff et al., 2012**).

The information gained from this study may be useful to highlight in the antenatal clinics the better integration of influenza vaccine during pregnancy. Unfortunately, the current nursing and medical curriculum rarely includes information related to

maternal vaccination during pregnancy. This deficit of knowledge among pregnant women should be addressed to help health care providers to integrate influenza vaccines into their clinical practice. In addition, this study will contribute to improving nursing practice especially concerning women follow-up and monitoring for early detection of any problems that may predispose pregnant women to any complications. Since nurses are considered a member of the health care team and work in a variety of settings, so, they have unique opportunities to address influenza vaccination during their clinical practice that might help pregnant women to understand how influenza infection during pregnancy can affect the pregnancy outcomes and their unborn baby.

Aim of the study

The current study aims to assess knowledge and beliefs regarding seasonal influenza vaccine among pregnant women attending antenatal clinics.

Research questions

1. What is the level of knowledge toward seasonal influenza vaccine among pregnant women?
2. What is belief level toward seasonal influenza vaccine among pregnant women?
3. Is there a relationship between demographic variables, knowledge and beliefs toward seasonal influenza vaccine?

Subjects and Methods

Research Design

A descriptive correlational research design was adopted for this study to achieve the study aim. A correlational study determines whether or not two variables are correlated. This means to study whether an increase or decrease in one variable corresponds to an increase or decrease in the other variable (**Boswell & Cannon, 2018**).

Setting

The study was conducted at the out-patient clinics at Al kasr Al Ainy university hospital which is affiliated with Cairo university hospitals which serves 100 to 120 pregnant women from different regions each working day and approximately 28000 annually (Statistical department, 2020). Out-patient clinics provides free healthcare to pregnant women as well as women with gynecological problems or complaints. The clinic is held by obstetricians and gynecologists as well as diploma nurses.

Sample

A non-probability convenience sample of 160 pregnant women was recruited based on the following. **Inclusion criteria** including all pregnant women in the second or third trimester that has willingness were asked to participate in the study. Women who had chronic disease, not welling to participate were excluded from the current study.

Sample size

A total of (160) pregnant woman was selected. The sample size was calculated using the following formula: n =N / 1+ N (e) 2 where, is the desired level of precision, which we have selected to be 5%.

Tools for data collection

Three tools were used; 1) Structured interviewing questionnaire, 2) Seasonal Influenza vaccine knowledge tools, and 3) Seasonal Influenza vaccine beliefs scale.

Structured Interviewing Questionnaire

This tool designed by researcher after extensive review, it consists of three parts; part I; included data related to demographic data as; age, level of education, occupational level, residence. And Part II: included data related to obstetrical history as; parity, gravidity, age at marriage, parity, and gestational age.

Structed Seasonal Influenza vaccine knowledge tool.

This tool was designed by researcher after extensive literature review, included data related to seasonal influenza vaccine knowledge consists of 15 questions to assess knowledge the following question were asked as; meaning, importance and time of vaccine during pregnancy, barrier not taken vaccine, and sources of this information. There were 15 question answer by yes and no. Yes response equaled two score and no response equals zero score. This knowledge measured through the scoring system include; three points were used to explore seasonal vaccine care knowledge formats as follow; The total knowledge scores were classified into two levels: score less than 60% was considered as insufficient level of knowledge when equal and more than 60% was considered as sufficient level of knowledge.

Likert belief scale regarding Seasonal Influenza vaccine. It was developed by researcher after extensive literature review. This tool included data related to belief scale regarding seasonal Influenza vaccine was measured by using 3 point Likert scale from 1-3 in which 1 mean disagree and 3 denote strongly agree.   Total scoring about beliefs was categorized into two levels less than 50% was considered as negative belief, and equal or more than 50% was considered as a positive belief.

Tool validity and reliability

 Tools were submitted to a panel of three experts in the fields of maternity and community health nursing this revision was performed to test the content validity, relevance, and clarity of the tools. Modifications were performed accordingly. The reliability of tools was tested using Cronbach's alpha test, and the result was highly respectively reliable (0.78 & 0.86) for tools (2 & 3).

Ethical Considerations

Official permission was granted from the director of maternity hospital. The researchers introduced themselves to the women who met the inclusion criteria and informed them about the purpose of this study to obtain their acceptance to share in this study. The researchers ensured that the study posed no risk or hazards on their health and their participation in the study is voluntary. Women in childbearing period who were willing to participate in the study and met the inclusion criteria were approached by the researchers and asked for oral consent to confirm their acceptance, and all events that occurred during data collection were considered confidential.

Pilot study:

It was conducted on 10% of the study sample, were selected randomly (16 women). It aimed to evaluate the simplicity and clarity of the tools. It also helped in the estimation of the time needed to fill in the forms. According to the results of the pilot study, simple modifications were done as rephrasing questions or canceling some questions. The needed modifications were done, and the participants in the pilot study were excluded from the final study sample.

Procedure:

Upon receiving the formal approval through the official permission and getting acceptance from the director of maternity hospital. The researcher introduces her to the participant and explains the purpose of the study in order to obtain their written acceptance to participate in the study as well as to gain their cooperation. The study was carried out through; interviewing, recruitment and assessment

Interviewing and recruitment

Before collecting the data, the researcher reviewed the recent literature to construct and prepare tools for data collection. Data collection tools were revised by experts in the field of obstetric and community health nursing. The researcher does modifications depend on the jury. Official permission was obtained from the administrative authority of the Obstetrics and Gynecology Department Hospital affiliated to maternity hospital and outpatient manager

The researcher met women who accept to participate in the study at the waiting station outside the outpatient clinic. The researcher interviewing the women and explaining the aim of the study. Moreover, the confidentiality of the information was assured. After obtaining approval and oral informed consent to conduct the study, data were collected three days/week, around five to seven women per day for three months. Data collection duration four months beginning from June to September (2019).

Assessment

Data collection through interviewing questionnaire with each woman by the researchers individually

using the tools for data collection. All participants women who fitted the inclusion criteria was recruited for the study, each women was interviewed individually to collect personal data, medical history, past obstetric history and preconception knowledge and health behavior and attitude was also be collected. The researcher faced the women, asked her questions in Arabic and record her answer in the tools, the interview was carried out in the waiting room at outpatient clinic. The researcher collected the data 4 days/week and time consumed to fulfill the questionnaire ranged from 30-45 minutes.

Statistical Analysis:
Collected data were coded and tabulated using a personal computer. Statistical package for social science (SPSS) version 23 was used. The researcher checked all data to avoid any discrepancies. Data were examined for coding and entry errors. Percentage, mean, standard deviation and frequency were used for analyzing the data. These tests were used to identify the significant of the relations. Level of significance was considered at p-value <0.05.

Results

Table (1): Demographic and obstetrical characteristics of the study sample

Variables	N (160)	%
Maternal Age (years)		
<20	20	12.5
20<35	93	58.1
≥35	47	29.4
M ± SD	29.98 ± 6.107	
Place of residence		
Rural	27	16.9
Urban	133	83.1
Level of education		
Can't read and write	19	11.9
Read and write	36	22.5
Primary & secondary school	73	45.6
High education	32	20.1
Occupation		
Working	83	51.9
House wives	77	48.1
Parity		
Primiparous	104	65
Multiparous	56	35

Table (2): Description of the study sample toward Knowledge about Influenza Vaccine during Pregnancy (n=160)

Items	N (correct answer)	%
Knowledge regarding influenza vaccine during pregnancy		
1- Did you hear about influenza vaccine? Influenza is an infectious disease	96	60
2-Source of the information		
- Internet/friends	22	13.8
- Social media	4	2.5
- Private hospital	63	39.4
- Health care provider	7	4.4
3-Influenza vaccine is given during pregnancy.	102	63.4
4-Influenza vaccine safe for pregnant women	85	53.12
5-Pregnant women at high risk for influenza more than non-pregnant woman.	114	71.3
6-Time for receiving influenza vaccine		
- 1st trimester	35	21.9
- 2nd trimester	89	55.6
- 3rd trimester	17	10.6
- Unknown	19	11.9

| Items	N (correct answer)	%
7-Influenza vaccine decrease risk for infection.	52	32.5
8-Influenza can lead to complications to fetus.	66	41.3
9-Influenza leads to complications for pregnant women.	94	58.8
10-Flu vaccine is safe in lactation.	100	62.5
11-Annual vaccination is the best way to protect from influenza.	95	59.4
12- Has anyone recommended for you're the vaccine?	87	54.4
13- If yes who recommended it?		
- Nurses	16	10
- Family/ friends	14	8.8
- Health care provider	57	35.6
14- Did you up take the vaccine?		
- Yes	68	42.5
- No	92	57.5
15- Barrier from not up takes it.		
- Mother fear from the vaccine.	26	16.3
- Mother not needs it.	43	26.9
- Expensive.	23	14.4
Total knowledge score		
Sufficient knowledge	83	51.9
Insufficient knowledge	77	48.1
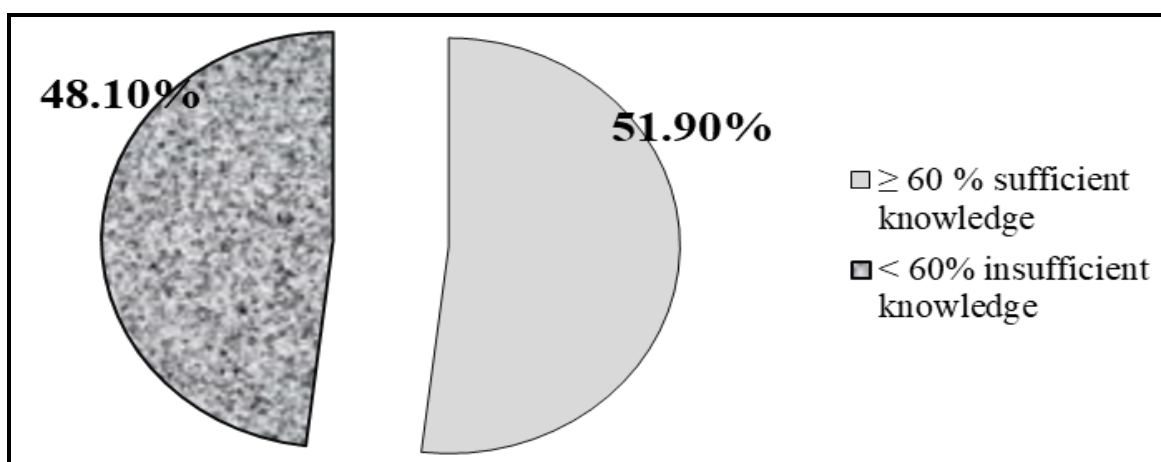
Figure (1): Distribution of study sample regarding to total knowledge score

Table (3): Description of the study sample toward beliefs of influenza vaccine during pregnancy (n=160)

| Variables	(1) Disagree	(2) Didn't know	(3) Agree
1-Influenza vaccine safe for pregnant women.	11(6.9%)	7(4.4%)	142(88.8%)
2-Influenza during pregnancy is easily prevented	76(47.5%)	33(20.6%)	51(31.9%)
3-vaccine should be given only for pregnant women how have influenza only	79(49.4%)	27(16.9%)	54(33.8%)
4-Influenza infection can lead to women hospitalized	11(6.9%)	17(10.6%)	132(82.5%)
5-All pregnant women should get flu vaccine	20(12.5%)	32(20%)	108(67.5%)
6-Influenza vaccine should be obligatory	81(50.6%)	38(23.8%)	41(25.6%)
7-Influenza vaccine may cause abortion or pregnancy loss	90(56.3%)	5(3.1%)	65(40.6%)
8-Influenza vaccine may cause fetal anomalies	68(42.5%)	12(7.5%)	80(50%)
Total categories beliefs categories			
- Negative	21 (13.1%)		
- Positive	139 (86.9%)		
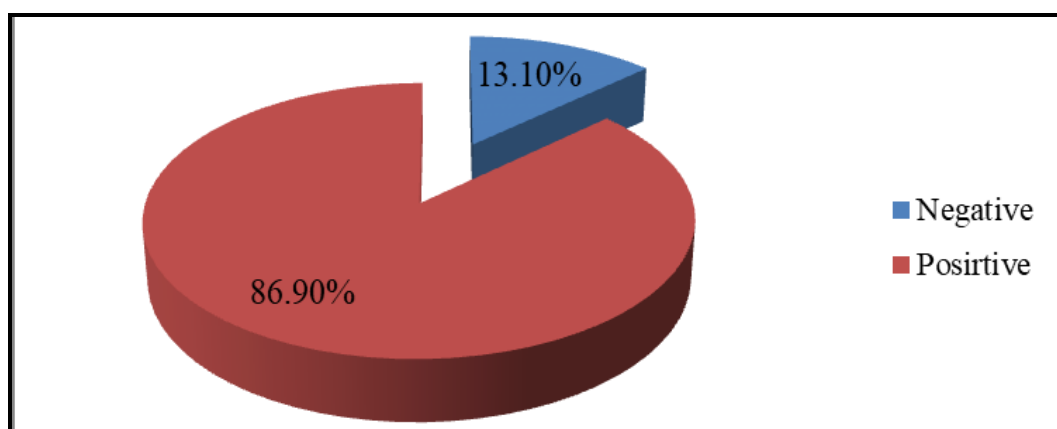
Figure (2): Distribution of study sample regarding to total beliefs score

Table (4): Relationship between mothers total knowledge categories and their belief regarding influenza vaccine

Items	Total knowledge categories		p-value
	Sufficient	**Insufficient**	
Belief categories			
Negative	6(7.22%)	15(19.48%)	x^2=13.51, P=0.001*
Positive	77(92.77%)	62(80.52%)	
Mean Maternal age	31.30 ±5.35	28.55 ±6.49	T=2.92, p=0.004
Level of education			
Can't read and write	12(63.2%)	7(36.8%)	
Read and write	16(45.7%)	19(54.3%)	χ^2=16.16, p=0.001*
Primary&Secondary school	47(64.4%)	26(35.6%)	
High education	8(24.2%)	25(75.8%)	
Parity			
-Primiparous	67(64.4%)	37(35.6%)	χ^2=18.74, p=0.001*
-Multiparous	16(28.6%)	40(71.4%)	

  ***Highly statistical significant differences**

Table (5): Association between mothers socio-demographic variables and belief categories of seasonal influenza (n=160)

Items	Total beliefs categories		p-value
	Negative belief	**Positive belief**	
Mean Maternal age	30.19± 6.62	29.94 ±6.01	T=0.16 , p= 0.86
Level of education			
Can't read and write	2(10.5%)	17(89.5%)	
Read and write	4(11.4%)	31(88.6%)	χ^2= 11.26 , p=0.010
Primary & secondary School	5(6.8%)	68(93.2%)	
High education	10(30.3%)	23(69.7%)	
Parity			
-Primiparous	6(5.8%)	98(94.2%)	χ^2=14.10 , p= 0.001*
-Multiparous	15(26.8%)	41(73.2%)	

  ***Highly statistical significant differences**

Table (1): Shows the demographics and obstetrical characteristics of the study sample. The age range of the study sample was ranged between 19-45 years old with the mean age 29.98 ± 6.107 years. More than three-quarters of the sample (83.1%) lives in an urban area. About half (45.6%) of the study sample had primary and secondary school and working (51.9%). About two- thirds of the study samples were primiparous (65%). The mean gestational age was 30.15±6.21 weeks and the mean age at marriage was 22.02±2.61 years.

Table (2): Represents the total mean knowledge score among the study sample regarding influenza vaccine during pregnancy which was 24.48 ± 4.766. The study findings show that (51.9%) had sufficient knowledge regarding subscale of vaccine during pregnancy (figure, 1).

Table (3): Illustrates the beliefs of the study sample on vaccine during pregnancy; the total belief means score among the study sample was 17.48 ± 3.59. The study finding shows that (88.8%) of the study sample agreed that the influenza vaccine is safe for pregnant women. (56.3%) disagreed that the influenza vaccine may cause abortion or pregnancy loss. Half (50%) of the study sample agreed that the influenza vaccine may cause fetal anomalies. Total categories belief was 86.9% of the study sample had positive belief regarding seasonal influenza vaccine (figure,2).

Table (4): It was observed that in the 69.8% of the study sample had a sufficient level of knowledge with a positive level of beliefs with highly statistically significant differences (p=0.001). Regarding the association between total level of knowledge and socio-demographic variables, there is statistical significant between total knowledge categories and mean age, level of educations, and parity (p< 0.05).

Table (5): Shows that there is a statistically significant difference between total beliefs categories with level of educations and parity (p< 0.05).

Discussion

Influenza vaccine during any trimester of pregnancy is considered safe for the mother and the fetus **(Maher et al., 2014).** Pregnant women are at an increased risk for contracting the influenza virus, vaccination with the flu vaccine during pregnancy is important in protecting the mother and her infant. Studies show flu vaccination during pregnancy is a safe effective method to protect both the mother and her infant; however, despite the benefits, many women elect against vaccinating with the flu vaccine during pregnancy. The current study aims to assess pregnant women's knowledge and beliefs regarding the influenza vaccine during pregnancy. The frame of the reference regarding the discussion is as follows; pregnant women knowledge about influenza vaccine during pregnancy and pregnant women beliefs of influenza vaccine during pregnancy, and factors affecting knowledge and beliefs regarding influenza vaccine during pregnancy.

The present study shows that half of the pregnant women had sufficient knowledge regarding subscale of vaccine during pregnancy while, the remaining had an insufficient level of knowledge. In the same line, more than two-thirds of the study sample had sufficient knowledge regarding the mode of transmission. More than have of the knowledge regarding the preventive measure. This is in the same line with **(Krishnaswamy et al., 2018).**

Concerning sources of seasonal influenza knowledge; the present study showed that the main sources were; internet, social media, books & newspapers, and through their friends from point of view of health care providers. Barrier not uptake vaccines from healthcare provider viewpoints as; fear from safety from the vaccine, women not need, and expensive. In contrast, **Abu-rish & his colleges (2016)**. They mentioned that the most commonly used source was newspapers (52.1%, n = 487) followed by health fairs (19.4%, n = 181), while much lower proportions of participants used brochures (10.7%, n = 100), physician office (9.6%, n = 90) or TV (8.2%, n = 77).

The present study shows that more than two-thirds of the study sample had positive beliefs regarding the seasonal influenza vaccine as compared to 13.1% who had negative beliefs. This in line with **Vishram et al., (2018)** who conducted a study on "Vaccination in pregnancy: Attitudes of nurses, midwives and health visitors in England" and reported that 73% of respondents would accept the influenza vaccine if they were pregnant. Practice nurses were most likely to report that they would accept influenza vaccines by (81%), midwives and health visitors (71%). There was an association between heath care workers who indicated they would accept influenza vaccine themselves if pregnant and who recommended it (OR 3.4, CI 2.4–4.7) to pregnant women.

The current study contradictory with a study done by **Barrett et al., (2018)** conducted a study "Influenza vaccination in pregnancy: vaccine uptake, maternal and healthcare provider's knowledge and attitudes. A quantitative study" and reported that a key objective of the healthcare providers survey was to assess knowledge of the risks associated with influenza during pregnancy. One thousand and eleven (86.1%) responders strongly agreed or agreed that influenza increased the risk of maternal complications, with a significant difference between healthcare providers groups, with general practionair and hospital-based healthcare providers answering more accurately than pharmacists (P = 0.003). Of 1172 responders, 74.8% (n = 877) strongly agreed or agreed that influenza was associated with increased risks of fetal complications Influenza vaccination in pregnancy: vaccine uptake, maternal and healthcare providers' knowledge and attitudes.

It is also in contrast with **Kalp,** (**2016**) who conducted the study" Predictors of Influenza Vaccination Compliance among Union and Nonunion Workers in a Pennsylvania Health Care System " who reported that Specific factors within the Influenza Knowledge Construct were statistically significant predictors of influenza vaccination outcomes. Three factors within the 6-factor Influenza Knowledge Construct were statistically significant in predicting vaccination outcomes among unionized health care workers: (1) Getting the flu can cause more severe illness such as pneumonia (p =.013, CI [1.045, 1.458]), (2) One can get the flu from the flu shot (p <.001, CI [.585,.764]),

and (3) People often get sick from flu injections (p <.001, OR = .45, 95% CI [.385, .513]). Two factors of the 6-factor Knowledge Construct were statistically significant in predicting vaccination behaviors among nonunion health care workers: one can get the flu from the flu shot (p <.012, CI [.555,70.929]), and People often get sick from flu injections (p <.001, OR =.47, 95% CI [.355, .612]).

The present study displayed   the relationship between Personal data of pregnant women and their Knowledge regarding the influenza vaccine, there is an association between maternal age and total knowledge, older women had a sufficient level of knowledge with statistically significant differences p= 0.004. As well as, women were had the primary and secondary school had sufficient level of knowledge with statistically significant differences. The current study also reveals that primigravid women had a sufficient level of knowledge with statistically significant differences. This may be related to primigravid being anxious about her baby and newly experiencing reading more and more to improve her outcomes.

In the same line, a study done by **Rowe, et al., (2019)** to assess variations by time of year and hospital in the uptake of influenza and pertussis vaccinations by pregnant women in Victoria; to identify factors associated with vaccination uptake. They reported that factors associated with vaccination included greater maternal age, primigravidity, early antenatal care, and GP-led care. The odds of vaccination were statistically significantly lower for women born overseas and those who smoked during pregnancy; the odds of vaccination were also lower for Aboriginal and Torres Strait Islander women.

While, with a study done by **Barrett et al., (2018)** who conducted the study "Influenza vaccination in pregnancy: vaccine uptake, maternal and healthcare providers' knowledge and attitudes. A quantitative study" reported that healthcare providers' were asked whether they felt confident recommending vaccination in pregnancy, as they believed it to be safe in pregnancy; in total, 12.5% (n = 146) of healthcare providers' who responded either disagreed (2.1%; n = 25), strongly disagreed (1.4%; n = 17), or neither agreed nor disagreed (8.9%; n = 104) with this statement. Significant differences were noted by years qualified, with those >15 years qualified reporting less confidence in vaccine safety. Healthcare providers' that were unvaccinated themselves were more likely to disagree with the statement on vaccine safety during pregnancy. Healthcare providers' were asked their opinion on factors that may encourage vaccination. Recommendations from the patient's Regarding healthcare providers' recommendations of the influenza vaccine to pregnant women, 73.2% (n = 532) of responding doctors, 72.4% (n = 21) of hospital-based healthcare providers', and 40.1% (n = 158) of responding pharmacists report that they recommend influenza vaccination all of the time. Obstetrician scored highest overall, at 89.0% (n = 1050). At the time of completing the questionnaire, 69.6% (n = 819) of healthcare providers' had received the influenza vaccination. Those <5 years post-qualification showed the lowest rates of influenza vaccination uptake. The present study shows that, young women, primigravida, and was had primary and secondary levels of education had positive beliefs toward vaccination during pregnancy.

Conclusion
The present study concluded that pregnant women had a sufficient level of knowledge and positive beliefs related to   influenza vaccination during pregnancies,   which   influence   their   practices. Addressing these could have a significant impact on improving vaccine uptake during pregnancy.

Recommendations
1. All antenatal care providers should offer maternal vaccinations according to national recommendations during each pregnancy, regardless of the interval between pregnancies.
2. The influenza vaccine can be given at any time during pregnancy, but preferably before the influenza season
3. 3-Maternal vaccinations should be offered to all pregnant women.
4. Maternal vaccination should be embedded in all antenatal care pathways, and systems should be improved to increase the uptake of vaccination by pregnant women.
5. Obstetrician–gynecologists and other health care providers should counsel pregnant women about the safety and benefits of influenza immunization.
6. Structural changes at the system level may improve maternal vaccination rates.

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