

## Knowledge and Beliefs of Immunization during Pregnancy among Reproductive Age Women in Saudi Arabia

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### ABSTRACT

**Background:** Various infectious diseases affect pregnant women causing serious complications which are preventable through vaccines that serve as a protection tool for both mother and fetus during pregnancy and further after delivery. **Objectives:** This study aims to explore the level of awareness about infectious diseases and importance of immunization, safety, and beliefs among reproductive age women in Saudi Arabia to identify the needs for initiating educational programs.

**Methods and materials:** A cross-sectional survey conducted between November 2016- January 2017 amongst reproductive age between 18-35 years old females from Al Ahsa, Eastern province in Kingdom of Saudi Arabia.

**Results:** A total of 783 females enrolled in the survey. One-third (31%) believed it is best to avoid immunizations during pregnancy. About flu vaccine, 40.2% of females deny that flu vaccination is strongly recommended for pregnant women during the flu season and 40.4% do not know about it. Most females (61.7%) have not heard or attended any activities about vaccination during pregnancy, but 59% are willing to attend any activity conduct regardless this issue. **Conclusions:** Overall, vaccine-related knowledge is poor among young adult females in Saudi Arabia. Therefore, prompt actions such planning for strategic initiatives and preparing an educational material is recommended to tackle this issue.

**Keywords:** Immunization, vaccine, Pregnancy, influenza, knowledge, beliefs.

### INTRODUCTION

Various infectious diseases affect pregnant women cause serious complications which are preventable through vaccines that serves as a protection tool for both mother and fetus during pregnancy and further after delivery. Since past few decades, evidence of consequences followed by infections is higher among pregnant women as it equivalently increased rates of admission and hospitalization as four times higher comparing to those whom are non-pregnant <sup>[1]</sup>. Furthermore, not only mothers but also their children whom are of age less than 6 months are also having higher mortality rate as a result of infections such as influenza than general population <sup>[2]</sup>.

A study conducted by **Carlson** reported that in 2009 H1N1 influenza once pandemic caused higher hospitalization rate among pregnant women with 7-fold rate and responsible for 6% of all accounted death comparing to 1% of the general population <sup>[3]</sup>.

A randomized controlled trial conducted in Bangladesh concluded that mothers who are immunized with influenza vaccine in third trimester had fewer respiratory complications related to influenza reduced by 36% compared to the control group <sup>[4]</sup>. Various observational studies conducted have demonstrated further findings that newborns of mothers immunized during pregnancy or preconceptions against influenza are protected from influenza symptoms <sup>[5]</sup>.

Therefore, the US Advisory Committee on Immunization Practices of the Centers for Disease Control (CDC) and World Health Organization (WHO) identified pregnant women as the highest priority group and advises pregnant women for prevention through receiving specific vaccine such influenza during flu season. Furthermore, there are additional specific vaccines recommended to uptake preconceptionally or postpartum such as MMR and varicella. Correspondingly, further vaccines must uptake with special circumstances in case the pregnant woman at risk of having hepatitis to receive hepatitis B vaccines <sup>[6]</sup>. Although all published studies and available data strongly support the safety and effectiveness of influenza vaccination during pregnancy but the uptake is remaining suboptimal. Some studies reported about barriers such as vaccine safety concerns, mistrust in the vaccine, low risk perception of the disease, and poor vaccine-related knowledge <sup>[7]</sup>.

Similarly, pertussis infection is also associated with increased risk of complication amongst newborns comparing to general population <sup>[8]</sup>. As hospitalization and mortality rates estimated of pertussis-infected babies are about Two-thirds occurrence <sup>[9]</sup>, therefore, US recommended in 2011 of routine administration for pertussis vaccine for pregnant women known as tetanus, diphtheria and acellular pertussis (Tdap)

vaccine. Although all recommendations, less than 5% of pregnant women vaccinated [10].

A study in Saudi Arabia found that immunization-related knowledge during pregnancy among health care workers have a low level of knowledge about influenza disease and its prevention by vaccines. Several studies have similar findings in Italy as misconceptions were prevalent about influenza vaccination [9]. Studies investigated barriers regarding poor uptake of vaccines; included lack of awareness, being afraid of adverse outcomes and inconvenience [10]. Furthermore, some studies found that obstetric health care providers (HCPs) often do not recommend for their patients to get vaccination [11-12].

Therefore, our aim of this study is to explore the level of awareness about infectious diseases and importance of immunization, safety and beliefs among reproductive age women in Al Ahsa, Kingdom of Saudi Arabia to identify the needs for initiating educational programs locally.

## MATERIALS AND METHODS

A cross-sectional study conducted between December 2016 to January 2017 amongst reproductive age between 18-35 years old Females from Al Ahsa, Eastern province in Kingdom of Saudi Arabia.

The sample size is calculated assuming 5% is the margin of error, at 95% level of confidence, number of population according to latest statistics provided by annual health statistics for reproductive age women in Al Ahsa between (18-35 years old) in 2011 is 653,000, but we assumed that population one million to compensate the increase in population and to get statistical significance, 385 subjects are required. However, 783 participants agreed to participate. Questionnaire composed of two categories: one elicited demographical data such age, education level, employment status and number of pregnancies while the second one included 19 closed-ended questions assessing knowledge with the possibility of yes/no – I don't know answers regarding the infectious diseases that are affecting women, their consequences, and prevention, beliefs and attitudes about immunization during pregnancy. A pilot study had done by distributing the questionnaire on 15 females to check whether it was easy to fill or they faced some difficulties in understanding the questions as an indicator for its clarity. According to their response, no changes needed, and the final version was distributed among participants. Paper copies of the questionnaire in Arabic Language distributed at our institution (King

Faisal University), at maternal and children hospital (MCH) in Al Ahsa, and at places where women are usually gathering in the region, such malls to avoid bias and respondents be from various age group. Participation was voluntary and verbal consent had been taken after they briefed with the rationale of the study with guaranteed confidentiality of all data and no incentives were offered to participants. Approval obtained from ethical committee at King Faisal University before conducting the study.

Statistical analysis performed through SPSS version 23. (SPSS, Chicago, IL) Descriptive characteristics of participants were applied. For the first category, which contains the demographics; frequencies were calculated and for variables which test knowledge qualitative descriptive statistics (means, median, counts, and percentages) were done. < 0.05 value considered as significant. Chi-square used to test if there is any correlation between the two categories.

## RESULTS

A total of 783 young adult females enrolled in the survey and filled the questionnaire. Demographic characteristics of participants are shown in **Table (1)** The Analysis of knowledge and beliefs related – items are provided in **(Table 2)** which suggested that majority of females (91.7%) believed that vaccines as preventative tool and 64.6% believed that pregnant women are more prone to get infections. Above half (62%) of females believed that specific vaccines are safe to uptake during pregnancy. However, one-third (31%) believed that it is best to avoid immunizations during pregnancy. Regarding pertussis, (49.8%) have never heard about pertussis and (45.2%) do not know that there is a vaccine for protection from pertussis and the majority (76.6%) do not know that pertussis vaccine is advised to be taken in every pregnancy. About flu vaccine, (40.2%) of females deny that flu vaccination is strongly recommended for pregnant women during the flu season and (40.4%) do not know about it. Interestingly, 61.8% do not know that when a pregnant woman is in need to get MMR vaccine, she should avoid becoming pregnant until one month after receiving the vaccine. Most females (61.7%) have not heard or attended any activities about vaccination during pregnancy but 59% are willing to attend any activity conduct regarding this issue. Furthermore, a significant correlation between socio-demographic characteristic and knowledge had been identified in the analysis **(table 3)**.

**Table (1): Demographic characteristics of participants in the survey**

	Characteristics	N= 783 (%)
<b>Age (years)</b>	30-35 (%)	169 (21.6%)
	21-29 (%)	270 (34.5%)
	18-20 (%)	344 (43.9%)
<b>Marital status (%)</b>	Married	416 (53.1)
	Divorced	2 (.3%)
	Single	365 (46.6%)
<b>Educational level (%)</b>	Primary school	22 (2.8%)
	Middle school/ Secondary	448 (57.2%)
	Bachelor degree or higher	313 (40%)
<b>Employment status (%)</b>	Yes	116 (14.8%)
	No	667 (85.2%)

**Table (2): Analysis items of knowledge and beliefs related to immunization during vaccination**

Item	Participants' response		
	Yes	No	I don't know
Do you believe that vaccines consider as a preventive measure against infections?	718 (91.7%)*	26 (3.3%)	39 (5%)
Do you believe that pregnant women are more prone to get infections?	506 (64.6%)*	134 (17.1%)	143 (18.3%)
Do you believe that specific vaccines are safe to uptake during pregnancy?	491 (62%)*	98 (12.5%)	194 (24.8%)
Do you know there are vaccines which are recommended during pregnancy?	374 (47.8%)*	186 (23.8%)	22 (28.5%)
Do you believe it is best to avoid immunizations during pregnancy?	243 (31%)	255 (32.6%)*	285 (36.4%)
Do you believe that it is safer to wait until 7 <sup>th</sup> month of pregnancy and further (third trimester) to receive a Whooping cough shot (Tdap) vaccine?	268 (34.2%)*	135 (17.2%)	380 (48.5%)
Do you believe that vaccines recommended during pregnancy could cause birth defects?	165 (21.1%)	342 (43.7%)*	276 (35.2%)
Have you ever heard about pertussis?	294 (37.5%)	390 (49.8%)	99 (12.6%)
Do you know there is a vaccine for protection from pertussis?	174 (22.2%)*	354 (45.2%)	255 (32.6%)
Do you know that giving the pertussis vaccine to pregnant women will protect newborn from getting pertussis?	172 (22%)*	236 (30.1)	375 (47.9%)
Pregnant woman is advised to take pertussis vaccine in every pregnancy.	87 (11.1%)*	96 (12.3%)	600 (76.6%)
Does pregnant woman at an increased risk of complications and needs of hospitalization from the flu?	493 (63%)*	105 (13.4%)	185 (23.6%)
Should all pregnant women get flu vaccine?	292 (37.3%)*	188 (24%)	303 (38.7%)
Is flu vaccination strongly recommended for pregnant women during the flu season?	152 (19.4%)*	315 (40.2%)	316 (40.4%)
Some vaccines have specific indications for uptake during pregnancy such hepatitis B?	291 (37.2%)*	102 (13%)	390 (49.8%)
If you need to get a MMR vaccine, you should avoid becoming pregnant until one month after receiving the vaccine.	227 (29%)*	72 (9.2%)	484 (61.8%)
If a pregnant woman needs to travel abroad in endemic area of a specific disease, she needs to consider further vaccines.	441 (56.3%)*	64 (8.2%)	278 (35.5%)
Have you ever attended any activities or while visits a health care centers received any information about vaccines in pregnancy?	147 (18.8%)	483 (61.7%)	153 (19.5%)
If there will be any activities regarding this issue for awareness are you interested to attend?	462 (59%)	150 (19.2%)	171 (21.8%)

\*Correct answers

**Table (3):** Correlation between characteristics and items

Characteristics	Items No.5	Items No.6	Items No.7	Items No.8	Items No.9	Items No.10
Age (years)	.002	.000	.017	.000	.000	.012
Marital status	.018	.000	.022	.018	.553	.556
Educational level	.097	.002	.944	.002	.000	.004
Employment status	.011	.045	.117	.203	.001	.017

**DISCUSSION**

Majority of females (91.7%) believe that vaccines as preventative tool and 64.6% believe that pregnant women are more prone to get infections. In contrast to other studies that demonstrated lack of awareness regarding importance of immunizing [13]. Above half (62%) of females believe that specific vaccines are safe to uptake during pregnancy. However, one third (31%) believe that it is best to avoid immunizations during pregnancy whom identified of being have poor knowledge among the targeted population as vaccination during pregnancy has long been public health priority from world health organization (WHO) [14].

Furthermore, among those who surveyed females, 64.6% believed that pregnant women prone to get infection with serious complication, whereas (17.1%, 18.3%) do not believe, do not know respectively. Similarly, previous studies confirmed that women are aware about the statement i.e. serious complication of infection during pregnancy is higher compared to those with general population [15]. Accordingly, some studies reported that pregnant women with co-morbidities were also more likely to be vaccinated [16]. In other studies, women refused to uptake the vaccines because they are unaware of its benefits or neglecting their effectiveness [17]. Another study reported that females refused to take vaccines during pregnancy as it could potentially cause harmful effects to themselves and their fetus [18]. Another study support these findings as it reported that 45% of pregnant women perceived that immunization is unsafe and may cause birth defects [19]. Regarding flu vaccine, (40.2%) of females denied that flu vaccination is strongly recommended for pregnant women during the flu season and (40.4%) did not know about it. The explanation beyond susceptibility of pregnant women of being prone at risk for infections is that physiological changes associated with pregnancy such cardiac, respiratory, immunological known changes which all contribute to exacerbate infection among pregnant women including reduced CD4 T-cell-mediated response [20]. Various studies reported support findings of our study that awareness of vaccination among females and pregnant women was moderately acceptable as the majority are aware about the serious complication

and importance of specific vaccine that recommended for pregnant women [21]. After the 2009 pandemic of H1N1 infection, seasonal vaccination substantially raised to approximately 50% [8]. Although the effectiveness and safety as announced by WHO and CDC, coverage for vaccination in many parts of the world remain suboptimal as data gained from database in UK revealed that roughly 21% of females are immunized which attributed to various factors such as knowledge gaps among health care providers or lack of awareness among population [19]. Similarly, another study conducted in France reported that 62.9% of pregnant did not get vaccination [20]. In fact, HCP must seriously consider the recommendation of influenza vaccine among high-risk group’s females. Results also showed that (49.8%) have never heard about pertussis, whereas (45.2%) did not know that there is a vaccine for protection from pertussis and the majority (76.6%) did not know that pertussis vaccine is advised to be taken in every pregnancy. Interestingly, 61.8% did not know that when a pregnant woman is in need to get MMR vaccine, she should avoid becoming pregnant until one month after receiving the vaccine. In contrast, a study conducted in USA reported that (45%) of targeted population in the study had immunization against influenza; whereas (79%) intended to receive the vaccine which demonstrated their awareness about importance of such vaccinations. In France, another study conducted among health care providers (HCP) reported that there were identified gaps and awareness must be encouraged among HCP to Improve coverage of vaccination for patients attended to them at clinics by any means such as providing them with evidence-based information on measles/MMR and regular teaching courses about this issue [21-22].

Most females (61.7%) have not heard or attended any activities about vaccination during pregnancy but 59% are willing to attend any activity conduct regarding this issue. Investigators attribute reduced knowledge of females about immunization to poor knowledge among HCP themselves about importance of vaccines or misposition. A study investigated the causes beyond that which reported similar interpretation and added that females afraid of potential consequences of receiving vaccine during pregnancy or being unsafe [23].

## CONCLUSION

In conclusion, overall, the knowledge about infectious diseases and their complications in pregnant women and immunization among young adult females in Saudi Arabia is low and insufficient. One thirds of participants believed that it is best to avoid immunizations during pregnancy, and one third of females were not aware that all pregnant women should get flu vaccine during flu season. Furthermore, above half of females did not know that there is specific indication to uptake specific vaccine such hepatitis B which all indicated poor knowledge amongst population. From the survey, the majority never received any information about vaccines in pregnancy. However, 59% are willing to attend activities conducted regarding this issue. Therefore, prompt action such as planning for strategic initiatives and preparing an educational material aiming for adult females at reproductive age to increase their awareness by messages or posts on social media and activities such as campaigns at public places. Recommendations of health care providers is crucial to increase their knowledge regarding this issue.

**CONFLICT OF INTERESTS:** no conflict of interests declared by authors to publish this study.

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