

Knowledge and Attitudes of Women toward the Influenza Vaccination during Pregnancy in Amman, Jordan

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Abstract

Objectives: The study aimed to assess the level of knowledge and attitudes of Jordanian women regarding influenza and its vaccine during pregnancy.

Methods: A cross-sectional study was conducted on 384 Jordanian women who had had a full-term delivery during the last 12 months. Data were collected with an interviewer-administrated questionnaire at five governmental comprehensive healthcare centers in Amman governorate.

Results: Most participants had moderate knowledge (78.1%) (average score of 6.08 ± 1.38 out of 10). Women were either positive (51.0%) or neutral (47.9%) towards the influenza vaccination during pregnancy (average score of 52.43 ± 6.29 out of 75). Further, the vaccination rate during the women's latest pregnancy was 2.1%. A significant positive relationship was found between the knowledge and attitudes of participants ($p=0.001$).

Conclusion: The vaccination rate was low among women during pregnancy. The study's results suggest that a greater awareness of the flu vaccine would help build positive attitudes towards its uptake during pregnancy. In this sense, antenatal care healthcare providers, such as gynecologists and midwives, should communicate strong health education messages about the flu vaccine as a preventative measure against influenza complications during pregnancy.

Keywords: Knowledge, attitudes, influenza vaccination, women, pregnancy, Jordan

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Introduction

Annually, global estimates suggest that seasonal influenza causes around three to five million cases of serious illness and between 290,000 and 650,000 fatalities [1]. Seasonal influenza is a communicable viral respiratory infection caused by influenza viruses in humans [2]. The severity of the disease ranges from mild to severe illness [2]. The risks and potential complications, such as hospitalizations and death, are the highest among young children, seniors older than 65, pregnant women, and individuals

of any age with serious medical conditions that may contribute to a higher risk of these complications [3].

Of all the different population strata, pregnant women are particularly vulnerable to a higher morbidity and mortality resulting from influenza [1, 3]. During pregnancy, alterations of immunological responses and physiological changes affecting the respiratory, cardiovascular, and renal systems are believed to increase the risk of complications [4]. In fact, the maternal physiological adjustment in the respiratory system, including reduced lung capacity, may reduce the ability to compensate for the effects of a respiratory illness during

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pregnancy, thus increasing the risk of hypoxemia [4].

The Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) have identified the flu vaccine as the best way to protect from influenza [1, 5]. In fact, the influenza vaccination provides some protection for pregnant women both during and after pregnancy [5]. In the Middle East, only two studies have been conducted to assess the knowledge and attitudes towards the influenza vaccination during pregnancy, and both were in Saudi Arabia [6, 7].

Although Jordan lacks a national policy for seasonal influenza vaccination [8], the Jordanian Ministry of Health (MoH) recommends it for high-risk groups such as pregnant women, but there is no clear estimation of vaccine uptake in this group [9]. For this reason, this study of Jordanian women aims to assess their level of knowledge on, and attitudes to, influenza and its vaccine during pregnancy, as it is an uncharted area in literature. Moreover, the study explores the relationship between knowledge, attitudes, and selected socio-demographic variables.

Methods

Study design

This descriptive cross-sectional study was conducted in five governmental comprehensive healthcare centers in Amman governorate. Data collection was conducted between March–May, 2018.

Target population

To reflect the entire period of pregnancy, the study targeted Jordanian women who had given birth to a live full-term new-born in the last 12 months.

Sample size

Sample calculation was based on the

coverage rate of influenza vaccination among pregnant women in Jordan. Since this rate is unknown, the most conservative estimate of 50% was used, with a confidence level of 95%. The minimum calculated sample size was 384 participants [10]. Assuming 10% unresponsiveness, the target sample was thus 422.

Sampling procedure

A convenience sample of five comprehensive governmental healthcare centers centrally located in Amman were included in this research. For sample allocation, statistics published by the MoH were used [11]. The number of child beneficiaries aged 0–1 year was used as an indication of the number of mothers visiting the selected centers. The study included Jordanian women who had had a full-term delivery during the last 12 months, they and provided verbal consent to participate.

Instruments of the study and scoring methods

A structured interviewer-administered questionnaire was designed by the researcher based on a thorough literature review [12–15]. The tools were modified for clarity and to suit the setting of Jordan. Approvals were obtained to use the research tools. The questionnaire was administered in Arabic. The process of translation and back translation was based on WHO guidelines [16]. The questionnaire's face and content validity were enhanced by reviewing related literature and evaluation by six experts in the field.

The questionnaire contained the following three sections:

Section 1: descriptive characteristics of participants, including socio-demographic, lifestyle and obstetric characteristics and history of chronic health conditions.

Section 2: assessment of women's factual

knowledge of influenza and its vaccine (9 yes/no/don't know questions and one multiple-choice question). Each correct answer was given one point while wrong/don't know answers scored zero. The maximum possible score was ten. Knowledge scores were categorized into three levels according to Bloom's cut-off points: poor/low (scores ranged between 0–4 points); moderate (scores ranged between 5–7 points); and, high (scores ranged between 8–10 points).

Section 3: assessment of women's attitudes towards influenza and its vaccine during pregnancy (fifteen Likert scale response options) focusing on perceived susceptibility, severity, barriers, and benefits, cues to be vaccinated, inaction regret, and vaccination regret. Scoring was as follows:

- Questions (26–28 and 32–39), 'strongly agree' (score of 5 points), 'agree' (score of 4 points), 'neutral' (score of 3 points), 'disagree' (score of 2 points), and 'strongly disagree' (score of 1 point).
- Questions (29–31 and 40), 'strongly agree' (score of 1 point), 'agree' (score of 2 points), 'neutral' (score of 3 points), 'disagree' (score of 4 points), and 'strongly disagree' (score of 5 points).

The maximum possible score was 75. Attitudes scores were categorized into three levels according to Bloom's cut-off points: negative (1.0–37.4 points), neutral (37.5–52.5 points), and positive (52.6–75.0 points).

For internal consistency, Cronbach's Alpha was calculated of 0.545 for knowledge questions and 0.633 for attitude questions.

Data collection

In the targeted centers, the researcher was directed to the Maternity and Child Health Department. The researcher approached mothers and asked a few questions to check

eligibility. When the mother met all eligibility criteria and agreed to participate, the researcher started the informed consenting process. Verbal consent was obtained since this study had no/minimal risk for participants. The consent process was based on information exchange with participants using an understandable language. The survey was anonymous as no personal identifiers were collected.

Pilot study

Piloting was carried out for an initial assessment of the questionnaire and to estimate the time needed to complete it. The pilot study included 20 women. The average time required to fill in the questionnaire was 15 minutes, and minor modifications were needed.

Data analysis

After finalizing data collection, the data were entered into SPSS software, version 22, for further analysis. The data were parametric based on a normal probability plot.

Descriptive statistics for continuous and categorical variables were used to depict the participants' characteristics and their knowledge and attitude levels. Chi-square and Fisher's exact probability tests were used to assess the association between binary/categorical study variables. In addition, independent sample *t*-test was used to assess the difference between continuous variables. A *p*-value of 0.05 or less was considered significant. Moreover, Pearson correlation was used to test the relationships between knowledge and attitudes scores.

Ethical approval

The study was approved by the Scientific Research Ethical Committee at the Jordanian MoH (180009).

Results

The researcher approached 422 women, but only 384 agreed to participate and complete the

survey questions (response rate 91%).

As shown from Table 1, the average age of participants was 29.50 ± 5.57 years. Most of the participants were bachelor's degree/diploma holders (57.6%). The average family monthly income from all sources was 716.05 JOD/month, with 22.7% of participants falling under the poverty line of 366 JOD/month [17]. Thirty-eight participants (9.9%) worked in the health sector. Only 31 participants (8.1%)

reported that the flu vaccine was covered by health insurance. A total of 29 women (7.6%) smoked cigarettes. In addition, 238 participants (62.0%) reported performing physical activity. Regarding obstetric characteristics, 68.8% had had more than one child, and 74.3% had had more than one pregnancy. Further, 130 participants (33.8%) had had at least one previous miscarriage.

Table 1. Socio-demographic, lifestyle, and obstetric characteristics of study participants (n=384)

Variable	Frequency (n)	Percentage (%)	Mean	SD*
Age group (Year)			29.50	5.57
15–19	7	1.8		
20–29	196	51.0		
30–39	168	43.8		
40–49	13	3.4		
Women: educational level				
Pre-high school (Tawjihi)	45	11.7		
High school (Tawjihi)	98	25.5		
Bachelor's degree/diploma	221	57.6		
Master's degree/doctorate	20	5.2		
Husband: educational level				
Pre-high school (Tawjihi)	49	12.8		
High school (Tawjihi)	105	27.3		
Bachelor's degree/diploma	194	50.5		
Master's degree/doctorate	36	9.4		
Family monthly income (JOD)**			716.05	666.03
< 366	87	22.7		
366–566	123	32.0		
567–767	50	13.0		
768–968	40	10.4		
969 or more	84	21.9		
Women: employment status				
Yes	98	25.5		
No	286	74.5		
Husband: employment status				
Yes	376	97.9		
No	8	2.1		
Husband: currently working in the health sector				
Yes	32	8.5		

Variable	Frequency (n)	Percentage (%)	Mean	SD*
No	344	91.5		
Women: ever worked in the health sector				
Yes	38	9.9		
No	346	90.1		
Women having insurance covering the flu*** vaccine				
Yes	31	8.1		
No	225	58.6		
Don't know	128	33.3		
Women receiving the flu vaccine covered by health insurance				
Yes	5	16.1		
No	26	83.9		
Smoking cigarettes				
Yes	29	7.6		
No	355	92.4		
Number of cigarettes				
1–14 cigarettes/day	22	75.9		
15–24 cigarettes/day	7	24.1		
≥ 25 cigarettes/day	0	0.0		
Exercise				
Yes	238	62.0		
No	146	38.0		
Exercise per week				
Less than twice a week	65	27.3		
2 to 3 times a week	97	40.8		
More than 3 times a week	76	31.9		
Number of pregnancies			2.99	1.93
1	99	25.8		
2–3	149	38.8		
4–5	97	25.3		
6 or more	39	10.2		
Number of living children			2.44	1.37
1	120	31.3		
2–3	178	46.4		
4–5	77	20.1		
6 or more	9	2.3		
Number of Abortions			1.63	1.03
None	254	66.14		
1–2	117	30.47		
3–4	13	3.39		

Variable	Frequency (n)	Percentage (%)	Mean	SD*
5 or more	0	0.00		
Number of Still Births			1.00	.000
None	377	98.2		
1–2	7	1.8		
3–4	0	0.0		
5 or more	0	0.0		

*SD=standard deviation; **JODs=Jordanian dinars; ***Flu=influenza.

No comorbidities were reported among participants. Ten (3.84%) were diagnosed with a chronic health condition. This data was self-reported.

Table 2 depicts the overall scores of knowledge and attitudes for the study participants. The highest proportion of

participants (78.1%) had a moderate level of knowledge (average score of 6.08 ± 1.38 out of 10). Further, women were either positive (51.0%) or neutral (47.9%) towards influenza vaccination during pregnancy (average score of 52.43 ± 6.29 out of 75).

Table 2. Total sample knowledge and attitudes scores

Total Sample	Range	Minimum Score	Maximum Score	Average Score	SD*
Knowledge score	0–10	2	10	6.08	1.38
Attitudes score	15–75	35.00	68.00	52.43	6.29

*SD=standard deviation

As shown in Table 3, women were knowledgeable about the nature of influenza infection and its risks. However, they had a poor knowledge of the MoH's influenza

recommendation (12.0%, n=46) and of vaccine safety during pregnancy (19.8%, n=76) and breastfeeding (20.8%, n=80).

Table 3. % distribution of correct answers on knowledge of influenza and its vaccine (n=384)

Items	Total n (%)
1. Influenza is a highly contagious disease Yes (correct answer) n (%)	358 (93.2%)
2. Influenza is a respiratory disease Yes (correct answer) n (%)	360 (93.8%)
3. Flu symptoms can be severe; it may lead to hospitalization Yes (correct answer) n (%)	357 (93.0%)
4. Children have a higher risk of hospitalization due to flu than adults Yes (correct answer) n (%)	336 (87.5%)
5. Pregnant women are at risk for complications of influenza similar to non-pregnant women No (correct answer) n (%)	296 (77.1%)

Items	Total n (%)
6. In Jordan, pregnant women are recommended to have the flu vaccine after the first three months of pregnancy Yes (correct answer) n (%)	46 (12.0%)
7. Having the flu vaccine during pregnancy is safe and has no serious side effects Yes (correct answer) n (%)	76 (19.8%)
8. Having the flu vaccine during breastfeeding is safe and does not negatively affect the health of the mother or baby Yes (correct answer) n (%)	80 (20.8%)
9. There are studies showing that having the flu vaccine during pregnancy can cause birth defects in the baby No (correct answer) n (%)	67 (17.4%)
10. The season in which flu typically occurs Winter (correct answer) n (%)	360 (93.8%)

Overall, only 7.8% (n=30) of participants were highly knowledgeable about influenza and its vaccine with the majority showing a moderate level of knowledge (78.1%, n=300). A low level of knowledge was shown by 7.8%, (n=30).

Participants or their husbands having prior

work experience in the health sector tended to have a higher level of factual knowledge about influenza and its vaccine ($p=0.003$ and $p=0.042$, respectively). Further, women who received an insurance-covered flu vaccine had a higher level of knowledge ($p=0.003$) (Table 4).

Table 4. Distribution of participants by socio-demographic variables and knowledge (n= 384)

Variable	Level of knowledge			p-value*
	Low <50% n (%)	Moderate 50–70 % n (%)	High > 70 % n (%)	
Age group (Year)				
15–19	1(14.3 %)	6(85.7%)	0 (0.0%)	0.700
20–29	19 (9.7%)	150 (76.5%)	27 (13.8%)	
30–39	9 (5.4%)	134 (79.8%)	25 (14.9%)	
40–49	1 (7.7%)	10 (76.9%)	2 (15.4%)	
Women: educational level				
Pre-high school (Tawjihi)	3 (6.7%)	37(82.2%)	5 (11.1%)	0.180
High school (Tawjihi)	9 (9.2%)	78 (79.6%)	11 (11.2%)	
Bachelor's degree/diploma	14(6.3%)	174(78.7%)	33(14.9%)	
Master's degree/doctorate	4 (20.0%)	11(55.0%)	5 (25.0%)	
Husband: educational level				
Pre-high school (Tawjihi)	4 (8.2%)	38 (77.6%)	7 (14.3%)	0.854

Variable	Level of knowledge			<i>p</i> -value*
	Low <50% n (%)	Moderate 50–70 % n (%)	High > 70 % n (%)	
High school (Tawjihi)	6 (5.7%)	87 (82.9%)	12 (11.4%)	
Bachelor's degree/diploma	17 (8.8%)	149 (76.8%)	28 (14.4%)	
Master's degree/doctorate	3 (8.3%)	26 (72.2%)	7 (19.4%)	
Family monthly income (JOD)**				
< 366	8 (9.2%)	67 (77.0%)	12 (13.8%)	0.228
366–566	9 (7.3%)	101 (82.1%)	13 (10.6%)	
567–767	2 (4.0%)	36 (72.0%)	12 (24.0%)	
768–968	4 (10.0%)	27 (67.5%)	9 (22.5%)	
969 or more	7 (8.3%)	69 (82.1%)	8 (9.5%)	
Women: employment status				
Yes	8 (8.2%)	74 (75.5%)	16 (16.3%)	0.735
No	22 (7.7%)	226 (79.0%)	38 (13.3%)	
Husband: employment status				
Yes	30 (8.0%)	294 (78.2%)	52 (13.8%)	0.511
No	0 (0.0%)	6 (75.0%)	2 (25.0%)	
Husband currently working in the health sector				
Yes	3 (9.4%)	20 (62.5%)	9 (28.1%)	0.042
No	27 (7.8%)	274 (79.7%)	43 (12.5%)	
Women ever worked in the health sector				
Yes	4 (10.5%)	22 (57.9%)	12 (31.6%)	0.003
No	26 (7.5%)	278 (80.3%)	42 (12.1%)	
Women having insurance covering the flu*** vaccine				
Yes	3 (9.7%)	24 (77.4%)	4 (12.9%)	0.592
No	21 (9.3%)	174 (77.3%)	30 (13.3%)	
Don't know	6 (4.7%)	102 (79.7%)	20 (15.6%)	
Women receiving the flu vaccine covered by health insurance				
Yes	0 (0.0%)	2 (40.0%)	3 (60.0%)	0.003
No	3 (11.5%)	22 (84.6%)	1 (3.8%)	

JOD=Jordanian dinars. *Flu=influenza. ***Bold italic*** indicates statistically significant ($p < 0.01$) findings; **bold** indicates statistically significant ($p < 0.05$) findings; *p*-values are for three-group comparison of knowledge level (low, moderate, high)

* Chi-squared test

Table 5. Percentage distribution of attitudes among participants (n=384)

Attitude item	Degree of response				
	Strongly agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly Disagree n (%)
I am so worried about getting the flu during pregnancy	215 (56.0)	71 (18.5)	8 (2.1)	85 (22.1)	5 (1.3)
I think that pregnancy will worsen the effects of the flu for me compared to others	172 (44.8)	103 (26.8)	20 (5.2)	83 (21.6)	6 (1.6)
I think that getting the flu during pregnancy might cause harm to the fetus	60 (15.6)	97 (25.3)	23 (6.0)	197 (51.3)	7 (1.8)
I think that the flu vaccine is unsafe during pregnancy*	21 (5.5)	111 (28.9)	140 (36.5)	103 (26.8)	9 (2.3)
I think that the flu vaccine is ineffective in preventing influenza infection during pregnancy*	4 (1.0)	49 (12.8)	96 (25.0)	222 (57.8)	13 (3.4)
I think that the flu vaccine will cause getting me sick with influenza*	6 (1.6)	40 (10.4)	40 (10.4)	266 (69.3)	32 (8.3)
I think that taking flu vaccine during pregnancy will protect my child's health during fetal development in the uterus	6 (1.6)	183 (47.7)	97 (25.3)	95 (24.7)	3 (0.8)
I think that taking the flu vaccine during pregnancy will protect my child from influenza infection during the first months of their life after delivery	7 (1.8)	181 (47.1)	100 (26.0)	95 (24.7)	1 (0.3)
I would take the flu vaccine during pregnancy if I knew that the Ministry of Health recommends it for pregnant women	154 (40.1)	163 (42.4)	15 (3.9)	45 (11.7)	7 (1.8)
I would take the flu vaccine during pregnancy if I was advised by my relatives to do so	22 (5.7)	110 (28.6)	30 (7.8)	193 (50.3)	29 (7.6)
I would take the flu vaccine during pregnancy if a friend advised me so	16 (4.2)	106 (27.6)	34 (8.9)	200 (52.1)	28 (7.3)
I would take the flu vaccine during pregnancy if my husband advised me so	63 (16.4)	158 (41.1)	22 (5.7)	125 (32.6)	16 (4.2)
I would take the flu vaccine during pregnancy if my doctor advised me so	236 (61.5)	131 (34.1)	4 (1.0)	13 (3.4)	0 (0.0)
I would regret not taking the flu vaccine if I got hospitalized because of pregnancy complications which resulted from an influenza infection	195 (50.8)	110 (28.6)	12 (3.1)	61 (15.9)	6 (1.6)
I would regret taking the flu vaccine during pregnancy if I got hospitalized due to pregnancy complications*	31 (8.1)	84 (21.9)	23 (6.0)	228 (59.4)	18 (4.7)

Note. For each question, the answers of 'strongly agree' and 'agree' were considered an expression of agreement, while 'strongly disagree' and 'disagree' were considered as an expression of disagreement.

* Reversed coded items

In this study, a high percentage of women perceived themselves as being susceptible to influenza infection during pregnancy (74.5%, $n=286$). They also had a high perceived severity as they believed that pregnancy would worsen the effects of influenza infection compared to others (71.6 %, $n=275$). However, they were less of the belief that it might cause harm to the fetus (40.9%, $n=157$).

Uncertainties regarding the vaccine's effectiveness and the possibility of causing an infection were not strongly reported as barriers to vaccine uptake (13.8%, $n=53$ and 12.0%, $n=46$, respectively). Nevertheless, 34.4% ($n=132$) of participants incorrectly believed that the flu vaccine is unsafe during pregnancy, with 36.5% ($n=140$) of participants having neutral views.

Regarding the perceived benefits of taking the influenza vaccine during pregnancy, half of the participants (49.3%, $n=189$) believed that it would protect their child's health during fetal development. In addition, 48.9% ($n=188$) believed it would protect their child from influenza infection during the first months of their life after delivery.

The most commonly reported cues to being vaccinated were the MoH (82.5%, $n=317$) and physicians (95.6%, $n=367$).

When the participants were asked about whether they would regret not having the flu vaccine during pregnancy should they be hospitalized because of influenza infection induced pregnancy complications, more than three quarters of the sample indicated that they would do so (79.4%, $n=305$). Further, when asked whether they would regret having the flu vaccine should they be hospitalized due to pregnancy complications 64.1% ($n=246$) of participants answered that they would not do so.

Overall, half of the study sample showed

positive attitudes towards the influenza vaccination during pregnancy (51.0%, $n=196$), while most of the remaining sample were neutral (47.9%, $n=184$). Moreover, the two comparison groups showed the same pattern of attitudes of the overall sample.

Monthly family income (JOD) was the only sociodemographic characteristic that showed a significant association with participants' levels of attitudes ($p=0.027$).

A significant relationship (positive correlation) was found between the overall knowledge and attitudes scores of study participants ($r=.164$, $p=0.001$).

Discussion

In this study, the highest proportion of participants were aged 20–29 (51.0%) (average age=29.50 years). Comparable results were obtained by Mayet et al. [6] in a study carried out in Saudi Arabia, as the highest proportion of participants were 20–29 years of age (38.8%).

It was also observed that most of participants held a bachelor's degree or diploma (57.6%), similar to the Saudi study's results of 54.1% [6].

Primigravida participants comprised 25.8% of the study participants, comparable to the results of both the Al-Musailhi et al. study [7] conducted in Saudi Arabia of 26.3%, and the Otieno et al. [18] of 26.4% targeting pregnant Kenyan women. In contrast, higher percentages were reported in a study in Germany (49.6%) [19].

Miscarriage was reported by 33.8% of participants, comparable to those in [18] of 27.3%.

High proportions of women were aware of the nature of influenza infection and its imposed risk. This might have been communicated through media, health education, school

curriculum and previous experience. The results are comparable to previous studies that showed similar high proportions [6, 13].

The study participants had poor knowledge of national influenza vaccination recommendations (12.0%), safety during pregnancy (19.8%), and breastfeeding (20.8%), similar to the results of Mayet et al. [6] (19.1%, 13.1% and 16.0%, respectively). Such poor knowledge could be explained by the lack of health education pertaining to influenza vaccination during pregnancy. On the contrary, other studies have reported a higher awareness among Swiss and Canadian women [12–13]. The possible explanation for such differences is the provision of a higher intensity of relevant health education in both countries.

Participants with previous experience of working in the health sector tended to have a higher level of factual knowledge about influenza and its vaccine, comparable to the study by Abu-Rish et al [20] targeting the adult Jordanian population. A possible explanation for this finding is that working in the health sector might increase the chance of being exposed to health-related information. Further, women whose husbands worked in the health sector showed a higher level of knowledge ($p=0.042$), suggesting an exchange of health-related information among household members.

In this study, a high percentage of women perceived themselves susceptible to influenza infection (74.5%). They also had a high perceived severity of (71.6 %). However, they were less of the belief that catching influenza during pregnancy might impose risks on the fetus (40.9%). This could be explained by women's perception of influenza as a disease that only affects the mothers' bodies without harming their fetus [21].

Safety concerns were the most frequently reported perceived barrier to influenza vaccination. Among unvaccinated women during their latest pregnancy, 34.8% of participants reported safety concerns, while 37.2% were neutral. This is similar to the results of Al-Musailhi et al. [7] of 34%. Having either negative or neutral attitudes highlights the need to spread awareness about the vaccine's safety during pregnancy. Higher negative attitudes were reported by a nationwide survey in Germany (64.4%) [19]. This could be related to the way women think of the vaccine, since a previous study stated that they consider it a medication and they are uncertain of its absolute safety [22].

The barrier of the vaccine's potential effectiveness was reported by 13.6% of the unvaccinated participants. A slightly higher percentage was reported by Bödeker et al. [19] of 21.1%. This concern was explained by the notion that the flu vaccine does not contain all circulating virus strains during an influenza season and the influenza virus mutates overtime [22].

Concerns about catching the influenza infection because of vaccine uptake was reported by 12.2% of the unvaccinated participants. This is consistent with the Ditsungnoena et al. study [14] in Thailand where 10.4% of participants were unwilling to be vaccinated. This was explained by women's perception of flu vaccine uptake and their feeling that injecting the virus could result in becoming sick [22].

Regarding the perceived benefits of having the flu vaccine during pregnancy, 49.2% of the unvaccinated women believed that taking the flu vaccine would protect their child's health during fetal development. This is comparable to the Thai study (52.1%) [14]. Further, our

overall sample percentage of 49.2% is comparable to [18] (60.4%).

In addition, 48.9% of unvaccinated women believed that taking the flu vaccine during pregnancy would protect their child from influenza infection during the first months of their life after delivery, which is also comparable to the Thai study (52.6%) [14]. The proposed explanation for these findings could be the health messages conveyed to mothers by healthcare professionals, including that whatever a mother takes during pregnancy will reach the fetus via the placenta.

Regarding cues to have the influenza vaccine, physicians and the MoH ranked the highest among the unvaccinated participants at 95.7% and 83%, respectively, which indicates their vital role in increasing the vaccine uptake in pregnant women. Reporting physicians as a major cue to action is consistent with the Thai study (64.7%) [14]. This was explained by the suggestion that physicians are considered a primary source of authenticated information regarding preventative measures to have a safe pregnancy. The finding on the MoH could be explained by women considering the ministry to be a trusted governmental body that recommends what is beneficial for the public.

Although half of participants had overall positive attitudes, the coverage rate during the participants' latest pregnancy was only 2.1%.

This finding could be explained by Yuen et al. [22], whose study indicated that reassurance on vaccine safety by healthcare providers was a key factor in being vaccinated. In this study, the highest proportions of participants reported a lack of sufficient information and not receiving recommendations from physicians as reasons to refrain from being vaccinated during pregnancy, which explains the low vaccine uptake.

This study's vaccination rate is comparable to Italy (5%) [23]. In contrast, other studies in Saudi Arabia, Germany, and Japan reported higher rates (18.1%, 15.69%, and 38.17% respectively) [6, 19, 24], which could be related to their strong recommendations on flu vaccine uptake during pregnancy.

We suggest that being knowledgeable about influenza and its vaccine contributes to building positive attitudes towards influenza vaccination during pregnancy. This is comparable to a study conducted in Saudi Arabia, where pregnant women with greater knowledge were more likely to show positive attitudes [7].

Conclusion

The study findings show that, despite having overall good knowledge about influenza and its vaccine during pregnancy, the vaccination rate was very low. The greatest reported barrier of safety may have led to such poor uptake. This indicates the need to communicate strong health messages about flu vaccine safety and its importance as a preventative measure to pregnant women by gynecologists and midwives. Further, the MoH should intensively communicate such health messages to the public.

Limitations

This was a quantitative study with limited insights on the reasons for women's attitudes. A qualitative study is recommended to shed more light on the barriers and facilitators to being vaccinated. Also, the sample was small. Hence, further studies should be conducted on a representative sample of women living in Amman and other governorates.

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المعرفة والاتجاهات لدى النساء عن مطعوم الإنفلونزا خلال فترة الحمل - عمان، الأردن

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الملخص

الأهداف: تهدف الدراسة لتقييم مستوى المعرفة والاتجاهات لدى النساء الأردنيات فيما يتعلق بالإنفلونزا ومطعومها أثناء فترة الحمل.

منهجية البحث: أجريت الدراسة المقطعية على 384 امرأة أردنية أنجبن خلال الإثني عشر شهراً الماضية بعد مرورهن بفترة حملٍ كاملة. تم استخدام استبيان يديره المُحاور. اشتملت الدراسة على خمسة مراكز رعاية صحية شاملة حكومية في محافظة عمان.

النتائج: حصلت أعلى نسبة من المشاركات على مستوى متوسط من المعرفة (78.1%) (متوسط النقاط 6.08 ± 1.38 من أصل 10). كانت النساء إما إيجابيات (51.0%) أو محايدات (47.9%) فيما يتعلق بمطعوم الإنفلونزا خلال فترة الحمل (متوسط النقاط 52.43 ± 6.29 من أصل 75). كما بلغت نسبة التطعيم خلال فترة حمل النساء مؤخراً (2.1%). لوحظ وجود علاقة طردية ذات دلالة إحصائية بين المعرفة والاتجاهات للمشاركات (قيمة احتمالية = 0.001).

الاستنتاجات: كانت نسبة التطعيم منخفضة بين النساء أثناء الحمل. وتشير نتائج الدراسة إلى أنّ زيادة الوعي حول مطعوم الإنفلونزا من شأنه أن يؤدي إلى بناء اتجاهات إيجابية فيما يتعلق بأخذه أثناء الحمل. وبهذا السياق، يتوجب على مقدمي الرعاية الصحية السابقة للولادة كأطباء النسائية والقابلات إيصال رسائل تثقيف صحي قوية حول مطعوم الإنفلونزا كإجراء وقائي ضد مضاعفات الإنفلونزا أثناء الحمل.

الكلمات الدالة: المعرفة، الاتجاهات، التطعيم ضد الإنفلونزا، النساء، الحمل، الأردن.