

ZURA KATSITADZE¹, SOPIKO GOGIA¹, KHATUNA LOMAURI²

UPTAKE OF INFLUENZA VACCINE IN PREGNANT WOMEN IN GEORGIA IN 2020-2021

¹USMD program, Tbilisi State Medical University, Tbilisi, Georgia²Department of Pediatrics, Tbilisi State Medical University, Tbilisi, Georgia<https://doi.org/10.52340/jecm.2022.02.08>**Abstract**

Utilization of influenza vaccine among pregnant women in Georgia remains suboptimal. To uncover some of the contributing factors to low uptake of influenza vaccine among pregnant women in Georgia. A cross-sectional survey was conducted in Spring-Summer 2021 on the postpartum women as the focus population. Females >18 years old were asked to complete the survey. The survey contained 14 items. The questions were categorized into 5 main groups. A total of 200 surveys were delivered to the hospitals. Survey results reveal that pregnant women's awareness and attitudes regarding the Influenza vaccination were subpar and not conducive to reliable efforts in optimal vaccine uptake. While the absolute majority of the study subjects confirmed that they had heard about the Influenza vaccine, less than a quarter of them accepted to be immunized. Importantly, half of the responders discussed the subject of immunization with their healthcare provider, however, had not made the final decision for vaccination. There is meaningful space to encourage pregnant women's awareness and education on benefits and safety of influenza vaccination during pregnancy. This is preferable to be performed through the education and information campaigning conducted by health care providers working in perinatal care facilities.

Introduction

Influenza viruses cause annual seasonal epidemics worldwide. Increased rates of infection are associated with the 2nd, 3rd trimesters of pregnancy [1] and the hospitalization rate due to Influenza complications is 4 times higher than that of the general population [2]. Official data from the USA², Canada [3], and Australia [4] suggest that 7-9% of patients in intensive care units (ICU) are pregnant women. Among these reports, the USA and Australian studies show viral pneumonia (confirmed with bilateral infiltrations on chest x-ray) in 40-49% of hospitalized patients; while in Australia, 20% of cases were further complicated by secondary bacterial pneumonia.

Influenza vaccine is estimated to prevent 40-50% of influenza hospitalizations in pregnant women per year [5]. Additionally, preterm birth and fetal growth restriction are also positively affected by the antenatal vaccine [5]. Since 2004, the Advisory Committee on Immunization Practices (ACIP) and the American College of Obstetricians and Gynecologists (ACOG) recommends influenza vaccination in women regardless of the trimester of pregnancy [6,7]. Nowadays, most countries' health authorities have issued recommendations for Influenza vaccination in pregnant women, with many low and middle income countries providing the vaccine for free and on-demand. Still, the coverage with Influenza vaccination remains very lower in this population, even in high income countries [8]. The reasons for the negligible level of influenza vaccine uptake during pregnancy are not well understood, although concerns about vaccine safety and efficacy are often cited by pregnant women as two of the determining barriers to vaccination [9-11].

In Georgia, Influenza vaccine popularity and uptake among pregnant women remains miserable; so are studies uncovering grounds for this problem in the country. We have approached this issue from the standpoint of knowledge of perceived benefits or harms of the influenza vaccine by pregnant women. The special questioner covering the topics of attitude and knowledge about the influenza vaccine, its benefits, and risks has been created and distributed among women who were pregnant in the 2020 flu season, or would have probability to be pregnant during the 2021 flu season.

Like the similar studies carried out in other countries [12,13], a clear pattern has been defined: lack of knowledge about vaccine's benefits and risks plays the main role in declining to be immunized.

Our findings define a clear framework for future efforts and are conducive to specific strategies which would be helpful in increasing the rate of influenza vaccine uptake in pregnant women in Georgia.

Materials and methods

Study design and participants

This cross-sectional study was developed and performed in Georgia to understand current and future influenza vaccination-related attitudes, practices, and beliefs in the pregnant Georgian population. The survey was conducted during May 17-June 30, 2021, in 3 private maternity care hospitals. Considering the novelty of the survey in Georgia, no established sample size was determined in advance. Females >18 years old were asked to complete the survey. It was conducted in accordance with all applicable laws of the Republic of Georgia.

Survey Instrument

The survey contained 14 items. The questions were categorized into 5 main groups: 1. Knowledge the influenza vaccine; 2. History of influenza vaccine experience; 3. The readiness of women to receive the influenza vaccine during the pregnancy; 4. The main reasons for rejecting the vaccine. 5. Socioeconomic characteristics of women, including age, educational level, and the type of the health insurance. The additional items asked about the presence of chronic diseases and whether the influenza vaccination was offered to the patient by obstetrician or no.

Results

A total of 200 surveys were delivered to the hospitals. Of these, 150 were given to Ob/Gyn healthcare providers and distributed to their patients during healthcare visits; 50 were distributed to the pregnant women in the reception area of one of the participating maternity clinics. The response rate was low for the former (32%) and even lower for the latter (<20%).

The mean age of the subjects was 26.4 years. A total of 29.4% of the responders have more than 1 higher education and 58.8% have at least 1 academic degree. All but 1 responder have heard about the influenza vaccination. A total of 18.31% (N=13) of the responders reported at least one influenza vaccination in the past. 81.95% of the subjects have never received an influenza vaccine.

Only 23.66% (N=17) of subjects have received or are planning to receive influenza vaccine during the pregnancy. 29.16% (N=21) of the responders have not decided whether they will receive the vaccine. 45.83% (N=33) of the subjects are not going to receive the influenza vaccine (**Fig. 1a**).

A higher proportion (37.5%) of the women in the 18-28 years' age range were compliant with the recommendation than in the other, older, age groups (**Fig. 1b**).

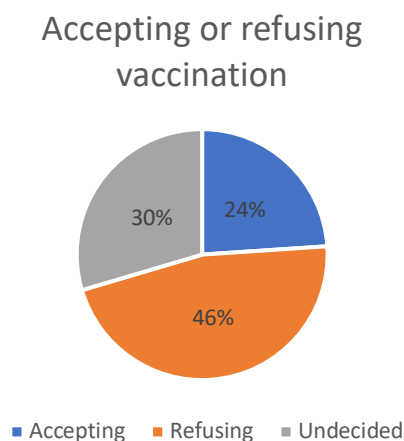


Figure 1a

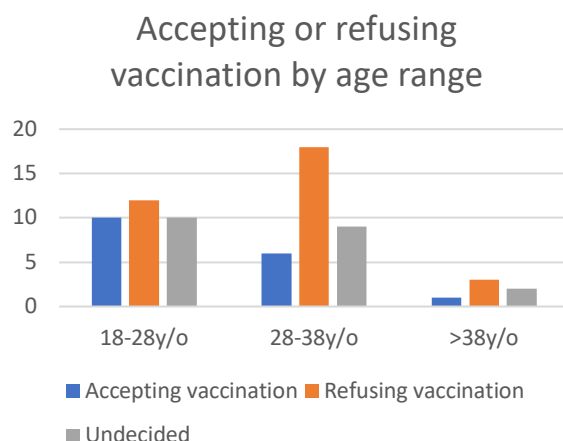


Figure 1b

Women with more than 1 academic degree had a high rate of vaccine acceptance of 46.66%, while any other formal education achievement fell under 25%; there was no positive correlation with having acquired 1 academic degree (**Fig. 1c**). Interestingly, the interviewees who disclosed having 1 or more academic degrees had a higher likelihood of having decided either for or against the flu vaccine rather than being undecided (70% and 80% respectively for 1 and >1 academic degrees); however, this did not necessarily indicate similarly higher odds of having the accurate knowledge (specifically in the 1 academic degree subgroup).

Accepting or refusing vaccination by level of formal education

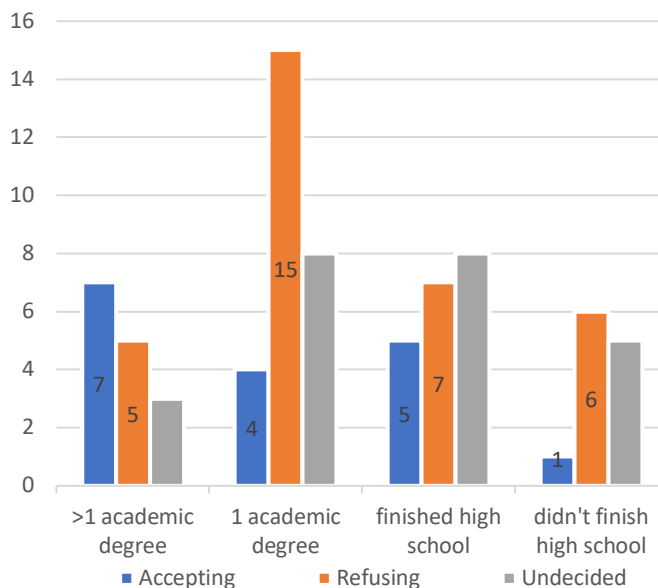


Figure 1c

A total of 35.9% of interviewees refusing the vaccine are avoiding the vaccination due to pregnancy. 30.30% did not define the reason for not receiving the vaccine. 18.18% are avoiding the vaccination due to the possible side effects to the fetus. 6.06% (N=2) think that the vaccine may negatively affect their health and 33.33% (N=11) think that the vaccine may not have a protective effect (Fig 2a). In contrast, the women who agreed to be vaccinated most commonly stated protective effects on the fetus as their motivating factor (Fig. 2b).

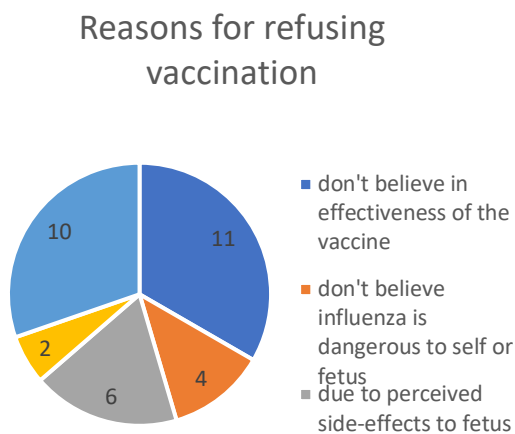


Figure 2a

Reasons for accepting vaccination

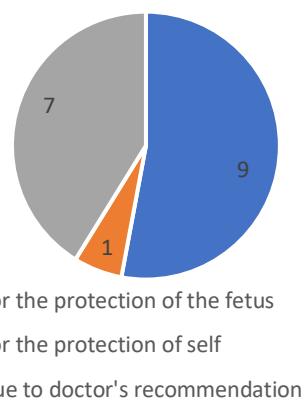


Figure 2b

23.61% (N=17) of the respondents have heard about the vaccine from more than one source. 48.61 (N=35) patients had not had the conversation about influenza vaccination with their healthcare provider, but this number could be due to the study carried out during spring and summer, non-influenza season.

A promising (however slightly) fact of the matter was the positive correlation between having discussed influenza vaccination with the healthcare provider and agreeing to influenza vaccination, with the NNT=7.66 (Fig. 3a). Another potential cue for deciding upon a flu vaccine was a previous history of getting one (Fig. 3b); those who accepted vaccination during current pregnancy were much more likely to have had a history of flu vaccine sometime in the past (OR=24.28), although this did not inquire into the timing of previous flu vaccines (eg. during previous pregnancy or outside any pregnancy).

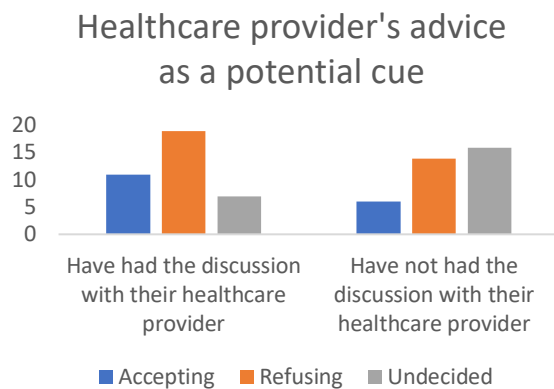


Figure 3a

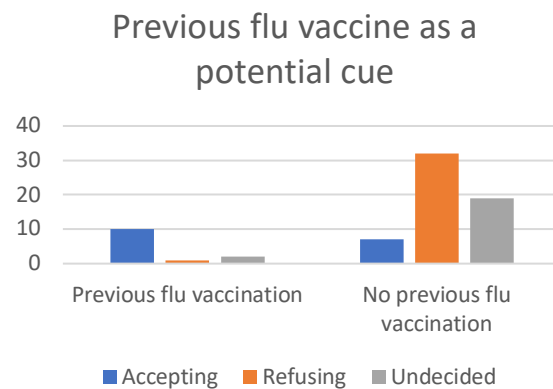


Figure 3b

Discussion

Prevention is the pinnacle of the public health response to Influenza, and vaccination is the most reliable means to this end. This holds that much truer for pregnant women who stand a higher risk of complications to them, their fetuses, and afterwards infants. Hence, pregnant women are classified as a high priority group, to be vaccinated in all trimesters and during breastfeeding during the influenza seasons. Immunization of women during pregnancy may be advantageous for the mother and the fetus; regarding the fetus, this is achieved in two ways: the passage of antibodies from the mother to the fetus during pregnancy, and by preventing infection in the mother and therefore decreasing the infant's risk of exposure [12]. Currently, the flu vaccine is not approved for use in children under the age of six months, making the latter point all the more significant. A randomized study in Bangladesh [14] showed that inactivated influenza vaccine given during pregnancy reduced laboratory-diagnosed influenza incidence by up to 63% in infants aged 6 months or younger. Still, vaccine utilization in pregnancy remains lower than in most other risk groups.

In Georgia during the 2018-2019 seasons, 465 cases of Influenza were laboratory-confirmed, of which 462 were type A and 3 were type B; out of these cases, 35 lethal outcomes were Influenza type A [15,16]. In 2009, 33 pregnant women passed away in Georgia, 5 of them due to confirmed Influenza infection. The incidence of upper respiratory tract diseases in infants was estimated 831.4 per 1000 in 2018 [15,16] in Georgia; in the same age group, 3635 hospitalizations were attributed to all infectious diseases.

Our study revealed vaccination coverage is much lower than that of some European and American nations – for example, 37% in the United States [17], 40-42% in England [18]; while France estimated a low rate of 7.4% in a national representative survey carried out during 2015-2016 [19]. Such discrepancies could partly be explained by the fact that methods and timing of data collection varied between these studies. In this line, our study is limited by the fact that the survey was conducted during a non-influenza season (late spring and early summer) and in a single year. In addition, our sample size was small, and the response rate was fairly low too. Therefore, these results may not be generalized to all populations of pregnant women in Georgia. Moreover, we have no information on the women who refused to participate in the survey, and they may be in some significant ways, different from the overall sample.

Of the surveyed patients, 23.66% reported receiving or planning to receive the influenza vaccine during the 2020/2021 season. This was in spite of the fact that almost all responders knew about the existence of the “flu shot”, and 51.38% recalled a discussion of the topic with their obstetrician during their prenatal course. However, according to the survey carried out among Georgian obstetrician-gynecologists in 2015, only 43% of physicians reported recommending influenza vaccination during pregnancy [20]. In our study, women who had discussed the issue of influenza vaccination with their physicians were more likely to get immunized (OR=2.12). This number, although appreciated, is in no way a cause for self-contentment. According to the previous study, it seems like the obstetrician-gynecologists currently are not up to par, when it comes to Influenza vaccination, with their ability to convince their patients of its necessity [20]. Indeed, if the vaccination gap is to be closed, not only would the other half of the patients have to have the discussion with their providers, but also the providers must be better trained to deliver discussion. Finally, a history of influenza vaccination was positively correlated

with chances of getting a vaccine during the current pregnancy. This on one hand is good news in that it alleviates the pressure from obstetrician-gynecologists and evens it out to all primary care practitioners. However, on another hand, it brings to the spotlight the dire state of flu vaccination efforts in the general population of Georgia. Regardless, the takeaway point from this is to emphasize the benefits of vaccination in all women of childbearing age, knowing what palpable difference it might make down the line during a future pregnancy.

The high rate of declining to be vaccinated, even after the suggestion of their care providers, underlines the need to provide reasoning and education along with the vaccine. The majority of women in our study incorrectly believed that pregnant women have the same risk of complications from influenza as non-pregnant women; 33.33% of the vaccine refusers also did not believe that vaccination had a proven efficiency in preventing the seasonal flu (especially the complicated) in mothers and infants. A greater educational effort in pregnant women is important not only for vaccination promotion, but also so that the pregnant women who do become infected seek medical attention early on; current statistics in the USA [2], Canada [3], Australia [4], revealed that all pregnant women hospitalized for influenza sought help after more than 2 days had passed, and not in the optimal timeframe for the pharmacological therapy to be most effective.

The need for better education efforts for pregnant women becomes obvious when exploring women's thoughts on safety. The vaccine is considered to be safe during all stages of pregnancy and breastfeeding; no serious adverse effects or undesirable outcomes have been identified in either women or infants [21,22]. Nonetheless, 18.18% of the vaccine refusers in our study identified doubts about vaccine safety during pregnancy and breastfeeding, as the primary rationale for their decision.

Several factors were identified as the potential positive cues for influenza vaccination. The younger age group (18-28y/o) had a higher likelihood of complying with the recommendation, and so did the women who had earned more than one academic degree.

Noteworthy, in Georgia, the very low vaccine coverage among pregnant women (and the general public) could be explained in part by the fact that national recommendations were relatively recent; countries that have implanted similar policies earlier have been showing a positive trend in immunization coverage over many years [23,24].

In summary, this is the first study surveying pregnant women in Georgia to uncover their knowledge and attitude towards influenza vaccination.

While high income countries of Europe and the USA have a long history of Influenza vaccination campaigns and investigating the barriers to their vaccination efforts, such studies have been scarce in the developing world. As such, both the physicians' possible reluctance to recommend vaccination and the reasons for pregnant women's hesitancy are of great interest. Overall, in our study the most commonly cited barriers for vaccination were doubts about safety and uncertainty about its necessity which highlights the importance of education programs for Georgian woman in reproductive ages and their physicians. Finally, additional research is needed to better define the barriers and the prompts currently present; the long-term goal of increasing vaccine uptake could only then be addressed appropriately.

Acknowledgments

The authors thank the medical doctors who distributed the questionnaire to their patients and the women who participated in the survey.

References:

1. Jamieson D, Honein M, Rasmussen S, et al. H1N1 2009 influenza virus infection during pregnancy in the USA. *Lancet* 2009; 374:451-58.
2. Jain S, Benoit S, Skarbinski J, Bramley A, Finelli L. Influenza-associated pneumonia among hospitalized patients with 2009 pandemic influenza A (H1N1) virus - United States, 2009. *Clinical Infectious Diseases* 2012;54(9):1221-29.
3. Kumar A. Critically ill patients with 2009 influenza A(H1N1) infection in Canada. *JAMA* 2009;302(17):1872.

4. Webb SAR, Aubron C, Bailey M, et al. Critical care services and the H1N1 (2009) influenza epidemic in Australia and New Zealand in 2010: the impact of the second winter epidemic. *Critical Care* 2011;15(3): R143.
5. Steinhoff M, MacDonald N, Pfeifer D, Muglia L. Influenza vaccine in pregnancy: policy and research strategies. *Lancet* 2014; 383:1611-13.
6. Cdc.gov. 2021. Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP).
7. Committee Opinion No. 608. *Obstetrics & Gynecology* 2014;124(3):648-51.
8. Lu P, Bridges C, Euler G, Singleton J. Influenza vaccination of recommended adult populations, U.S., 1989–2005. *Vaccine* 2008;26(14):1786-93.
9. Eppes C, Wu A, You W, Cameron K, Garcia P, Grobman W. Barriers to influenza vaccination among pregnant women. *Vaccine* 2013;31(27):2874-78.
10. Panda B, Stiller R, Panda A. Influenza vaccination during pregnancy and factors for lacking compliance with current CDC guidelines. *The Journal of Maternal-Fetal & Neonatal Medicine* 2010;24(3):402-06.
11. Henninger M, Naleway A, Crane B, Donahue J, Irving S. Predictors of seasonal influenza vaccination during pregnancy. *Obstetrics & Gynecology* 2013;121(4):741-49.
12. Yudin M, Salaripour M, Sgro M. Pregnant women’s knowledge of influenza and the use and safety of the influenza vaccine during pregnancy. *Journal of Obstetrics and Gynaecology Canada* 2009;31(2):120-25.
13. King J, Hanson K, Donahue J, et al. Survey of influenza vaccine knowledge, attitudes, and beliefs among pregnant women in the 2016–17 season. *Vaccine* 2020;38(9):2202-08.
14. Zaman K, Roy E, Arifeen S, et al. Effectiveness of maternal influenza immunization in mothers and infants. *New England Journal of Medicine* 2008;359(15):1555-64.
15. Idfi.ge. ინფექციური დაავადებების სტატისტიკა საქართველოში, 2021.
16. ncdc.ge. ჯანმრთელობის დაცვას ტატიკური ცნობარი, საქართველო, 2018.
17. Ding H, Black C, Ball S, et al. Influenza vaccination coverage among pregnant women — United States, 2016–17 influenza season. *Morbidity and Mortality Weekly Report* 2017; 66(38):1016-22.
18. Public Health England 2017. Surveillance of influenza and other respiratory viruses in the UK: Winter 2016 to 2017.
19. Descamps A, Launay O, Bonnet C, Blondel B. Seasonal influenza vaccine uptake and vaccine refusal among pregnant women in France: results from a national survey. *Human Vaccines & Immunotherapeutics* 2019;16(5):1093-1100.
20. Dvalishvili M, Mesxishvili D, Butsashvili M, Kamkamidze G, McFarland D, Bednarczyk RA. Knowledge, attitudes, and practices of healthcare providers in the country of Georgia regarding influenza vaccinations for pregnant women. *Vaccine* 2016;34(48):5907-11.
21. Munoz F, Greisinger A, Wehmanen O, et al. Safety of influenza vaccination during pregnancy. *American Journal of Obstetrics and Gynecology* 2005;192(4):1098-1106.
22. Deinard A, Ogburn, P. A/NJ/8/76 Influenza vaccination program: Effects on maternal health and pregnancy outcome. *American Journal of Obstetrics and Gynecology* 1981; 140(3):240-45.
23. Tong A, Biringer A, Ofner-Agostini M, Upshur R, McGeer A. A cross-sectional study of maternity care providers’ and women’s knowledge, attitudes, and behaviours towards influenza vaccination during pregnancy. *Journal of Obstetrics and Gynaecology Canada* 2008;30(5):404-10.
24. Martinello R, Jones L, Topal, J. Correlation between healthcare workers’ knowledge of influenza vaccine and vaccine receipt. *Infection Control & Hospital Epidemiology* 2003; 24(11):845-47.

