

Attitude of parents towards seasonal influenza vaccination for children in Saudi Arabia

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ABSTRACT

Introduction: The aim of this study is to assess attitudes, beliefs, and behavior towards seasonal influenza vaccination for children among parents in Saudi Arabia and to correlate parental demographic characteristics with hesitancy. **Methodology:** This is a cross-sectional study conducted in the Family Medicine clinics linked to a tertiary referral hospital in Riyadh. Inclusion criteria were: being a parent, having a child aged six months to 14 years whom is following at that hospital, and living in Saudi Arabia. The Parent Attitudes about Childhood Vaccines (PACV) survey was used for data collection. Demographic questions were added. **Results:** The number of participants was 388. Out of these, 298 (76.8%) parents were not hesitant for their child to get vaccinated. Whereas 90 (23.2%) parents were hesitant. Parental gender and age were the only demographic factors found to have a statistically significant impact on their hesitant behavior. For the influenza season of 2018–2019, 148 (38.14%) children received the influenza vaccine. The most common reason for not receiving it was the belief that the vaccine is not necessary. While 25 (27.78%) of the 90 parents who were hesitant allowed their child to get vaccinated, 123 (41.28%) of the 298 parents who were not hesitant allowed their child to get vaccinated, creating a statistically significant difference ($p = 0.0255$). **Conclusion:** Despite the overall positive attitude and low hesitancy, the vaccine uptake was low. Improving access, education about the importance of the vaccine, advocacy from doctors, and correction of misconceptions about it will facilitate an increase in the uptake.

Keywords: Attitude, influenza, parent, Saudi Arabia, vaccine

Introduction

Seasonal influenza can be caused by influenza A, influenza B, or influenza C viruses resulting in an acute respiratory infection.^[1] Influenza viruses are cyclically prevalent throughout the world, more commonly during autumn and winter.^[2,3] Characteristics of seasonal influenza are fever of sudden onset,

headache, dry cough, musculoskeletal pain, a severe malaise, sore throat, and a runny nose.^[2]

Without medical attention, fever and other conventional symptoms may resolve in a week's duration for the majority of patients.^[2] Elderly and children, especially younger than two years old, and certain health conditions can predispose to serious flu complications.^[3] Particularly for people who exhibit high risk factors, influenza can cause severe illness or even death.^[2]

As per the Centers for Disease Control and Prevention (CDC), getting vaccinated each year is the best method to prevent flu and prevent its transmission to others. Annual influenza

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vaccination using any flu vaccine that is licensed and age appropriate is recommended for everyone aged six months and older. Vaccination reduces the incidence of influenza, visits to doctors, and the number of school days and workdays that are missed due to influenza. Vaccination also prevents flu-related children's hospitalizations and deaths.^[3]

The Saudi Ministry of Health (MOH) advocates for influenza vaccination. The MOH provides the influenza vaccine to be taken at school and even at home. It also launched a national campaign for seasonal influenza on October 14, 2018. It invited all community members to participate in taking an initiative to get vaccinated for influenza at primary health care centers, the MOH's hospitals, and shopping centers.^[4]

Several studies have assessed hesitancy to vaccines in general. Also, there are studies that assessed attitudes towards influenza vaccine, with an emphasis on healthcare providers. However, a few studies targeted parents for assessment of parental attitude towards seasonal influenza vaccination for their children.^[5-7]

It has been shown that the parents' knowledge and attitude towards vaccines have an impact on the immunization of their children.^[8] Therefore, it is important to assess the parents' knowledge, attitudes, and beliefs towards childhood influenza vaccination to further aid health care providers in a better understanding of the factors that contribute to parents' refusal when offering seasonal influenza vaccination to their children.

The aim of this study was to assess attitudes, beliefs, and behavior towards seasonal influenza vaccination for children among parents in Saudi Arabia and to discern any correlation of parental demographic characteristics with hesitancy.

Material and Methods

In this cross sectional study, the survey candidates were selected from the Family Medicine clinics at a tertiary referral hospital in Riyadh, Saudi Arabia. The inclusion criteria was: being a parent, having a child aged six months to 14 years whom is following at this hospital, and living in any of the 13 regions of Saudi Arabia. The sample size was estimated to be 384 using *OpenEpi*, an online epidemiological free calculator, with a 95% confidence interval (CI) and a five percent margin of error. The data was collected by a convenience sampling technique from May 2019 through July 2019.

The Parent Attitudes about Childhood Vaccines (PACV) survey was utilized for data collection. The PACV survey is a valid and reliable tool that helps to identify parents who have hesitancy toward childhood vaccines.^[9-11] It has 15 points under three domains: behavior toward the vaccine, beliefs about the safety and efficacy of the vaccine, and overall attitudes and trust. The PACV survey has been particularly modified and validated for the influenza vaccine.^[5] There are different formats to the responses on the PACV that consist of dichotomous

replies, five point Likert scales, and 11-point scales. Seven socio-demographic items and two questions about the child's receipt of the influenza vaccine for the influenza season of 2018–2019 were added.

The PACV survey has been developed in the Spanish language in addition to English.^[12] In this study, an Arabic version of the PACV was adapted. The survey underwent forward translation and expert panel review, followed by back translation and pre-testing to ensure high quality of translation. The survey was then prepared to be self-administered electronically using *SurveyMonkey*, an online survey tool. Pilot testing was done. After that, parents who fulfilled the inclusion criteria were invited to participate in this study by data collectors. The PACV score was calculated as per the calculation method provided by Opel *et al.*^[10] Responses to the individual 15 items of the PACV were sorted into three categories: hesitant, not sure, and non-hesitant.

The research project was conducted in accordance with the policies of the Research Advisory Council (RAC) at the hospital. Approval of the study from the Institutional Review Board (IRB) at the hospital and ethical approval were obtained RAC# 2191-078. The approval from the Research Ethics Committee was obtained on March 28, 2019. Data were entered and analyzed using the software Statistical Package for the Social Sciences (SPSS), version 23 by IBM Corporation. Descriptive statistics were reported as mean and standard deviation for the continuous variables, whereas frequencies and percentages were used to describe categorical variables. As for analytical statistics, means of continuous variables were compared using the Student's t-test and ANOVA, while the Chi-square test was used to compare categorical variables. Statistical significance was set to $P < 0.05$.

Results

Three hundred and eighty-eight parents participated in our study. Demographics of the participants are provided in the table [Table 1]. The number of mothers and fathers who participated in the study was 195 and 193, respectively. Almost half of the parents (46%) were 30–39 years old and only two parents were above the age of 59 years. The majority of parents (97%) were married. Regarding the educational level, a college graduate level prevailed (54%), followed by the level of a high school graduate (28%). Forty-two percent of the participants were living in Riyadh, while the rest of the participants came from the other 12 regions of Saudi Arabia [Figure 1]. The child age was variable and the monthly household income mostly lied in the range of 5,000-20,000 Saudi riyals.

Regarding the degree of hesitancy measured by the PACV score, 298 (76.8%) of parents were non-hesitant whereas, 90 (23.2%) of parents were hesitant. However, the number of children who did not receive the influenza vaccine for the influenza season of 2018–2019 was 240 (61.86%). Demonstrated in the

data table [Table 2], among the 90 parents who were found to be hesitant regarding their children getting vaccinated, 25 (27.78%) allowed their child to get vaccinated. In comparison, 123 (41.28%) among the 298 parents who were not found to be

hesitant allowed their child to get vaccinated. This difference is statistically significant ($p = 0.0255$).

The most common reason for not receiving the vaccine was the belief that the vaccine is not necessary, followed by the vaccine was not recommended by the doctor, constituting for 36.2% and 30.82% among all the reasons, respectively [Figure 2].

Concerning demographic factors and the possible effect on hesitant attitude, only two factors were found to have a statistically significant effect. Fathers were more hesitant than mothers ($p = 0.01$). Also, a hesitant attitude was more evident with older parental age (≥ 50 years) ($p = 0.04$). However, marital status, educational level, household income, the region of residency, and child age did not appear to influence parental hesitancy [Table 3].

Table 1: Demographic characteristics of the study population (n=388)	
Demographic Characteristics	n (%)
Gender:	
Mother	195 (50)
Father	193 (50)
Age:	
20-29	54 (14)
30-39	177 (46)
40-49	126 (32)
50-59	29 (7)
>59	2 (1)
Marital Status:	
Married	378 (97)
Divorced	10 (2)
Educational Level:	
Less than high school	33 (9)
High school graduate	109 (28)
College graduate	208 (54)
Master's or PhD	38 (10)
Region:	
Central	164 (42)
Eastern	41 (11)
Western	46 (12)
Northern	70 (18)
Southern	67 (17)
Child age:	
6 months-3 years	118 (30)
4-7 years	101 (26)
8-10 years	85 (22)
11-14 years	84 (22)
Monthly Household income:	
< 5,000 SAR	48 (12)
5,000-10,000 SAR	174 (45)
15,000-20,000 SAR	126 (32)
>20,000 SAR	40 (10)

Discussion

The presented study aimed to assess the attitudes, beliefs, and behaviors of parents in Saudi Arabia towards seasonal influenza vaccination for children. Few studies in Saudi Arabia have assessed parental attitudes and beliefs towards influenza vaccination. One study had the parents included among the study population,^[14] and the other one, similar to our study, only focused on parents.^[15] The study done by Alolayan *et al.* was done in Qassim, and it revealed an overall positive attitude of the participants (94.7%).^[15] On the other hand, a US nationally representative survey conducted to assess hesitancy of parents towards the routine childhood vaccinations and influenza vaccinations found that more than one quarter of parents were found to be hesitant towards the influenza vaccine.^[16]

In our study, 148 (38.1%) children received the influenza vaccine in the influenza season of 2018-2019. There is no available data in the literature regarding the childhood uptake of the seasonal influenza vaccine in Saudi Arabia. A study done in Turkey on parents with high socioeconomic status following the 2011–2012 influenza season revealed that only 25 (8.8%) of the 285 children who participated in the study received the influenza vaccination.^[17]

A study conducted in Singapore on 332 parents of children who were attending pre-schools and were aged six months to

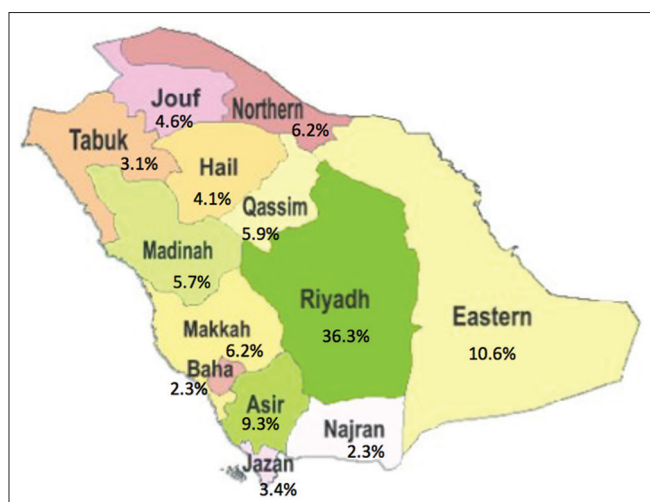


Figure 1: Percentage of participants from each of the 13 regions of Saudi Arabia.^[13]

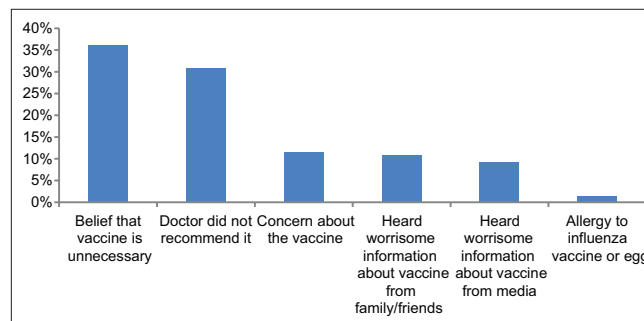


Figure 2: Reasons for not receiving the flu vaccine

Table 2: Parents' hesitancy by flu vaccine uptake (2018-2019)

	No	Yes	Total
Not Hesitant (n)	175	123	298
(%)	58.72	41.28	76.8
Hesitant (n)	65	25	90
(%)	72.22	27.78	23.2
Total (n)	240	148	388
(%)	61.86	38.14	

Table 3: Socio-demographic characteristics and likelihood of flu vaccine refusal

Parent demographics	OR (95%CI)	P
Parent gender (ref=mother)	1.82 (0.50, 0.80)	0.01
Parent age (ref=20)	2.26	0.04
Marital status (ref=married)	2.26	0.26
Education level (ref=Didn't go to school)		
Studied at school but didn't graduate	1.05 (0.16, 6.67)	0.95
Graduated from school	0.85 (0.15, 4.51)	0.85
Went to college but didn't graduate	0.77 (0.12, 5.01)	0.79
Bachelor degree	1.20 (0.23, 6.18)	0.82
Master degree	2.77 (0.37, 20.50)	0.31
Doctorate degree	0.77 (0.09, 6.32)	0.81
Household income (ref <5000)		
5000-10000	1.97 (0.91, 4.23)	0.08
15000-20000	1.95 (0.83, 4.57)	0.12
More than 20000	3.12 (0.92, 10.51)	0.06
Region (ref=Riyadh)		
Qassim	0.52 (0.19, 1.38)	0.19
Makkah	1.94 (0.53, 7.15)	0.31
Madinah	1.19 (0.39, 3.59)	0.75
Eastern province	1.39 (0.56, 3.41)	0.46
Asir	0.90 (0.37, 2.19)	0.83
Child age in months (ref=6)	0.993	0.5

five years showed that despite the high willingness to vaccinate, the percentage of children who had ever received the influenza vaccine was 32%, and the percentage of children who had received it in the past year was 15%.^[7] Low uptake of influenza vaccine in children was also evident in studies from Pakistan and India.^[5,6]

Parent vaccine hesitancy was assessed using the PACV score in the pediatric emergency department of a tertiary pediatric hospital in Seattle, WA.^[18] Also, the PACV has been used in an inpatient setting in a study done by Hofstetter *et al.*^[19] Both studies demonstrate that the threshold of ≥ 50 on the PACV score corresponds to a parent who is hesitant to vaccination and whose child is prone to be under-immunized due to parent's hesitancy. In addition, vaccine hesitancy in parents was associated with influenza vaccine declination.^[18,19] Data in this study collected in an outpatient setting further supports the association between parental hesitancy and uptake of the vaccine by children [Figure 3].

In our study, the fathers were more hesitant than mothers. This finding corresponds with what was found in the study of

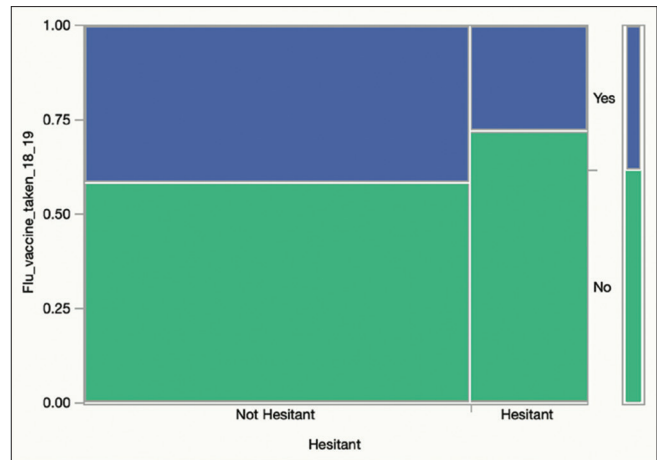


Figure 3: Contingency analysis of hesitant by flu vaccine taken 2018-2019

Alolayan *et al.* that women had more positive attitudes towards influenza vaccination than men.^[15]

Previous studies showed that it was more likely for individuals with higher education levels to get their children immunized with the influenza vaccine.^[20,21] In a Pakistani study that was done to evaluate the parents' awareness, attitude, and behavior towards influenza vaccination, there was a significant association between the positive attitude of parents towards vaccination and the level of education.^[6] This was also evident in the results of the US national survey conducted by Kempe *et al.* where a significant association was found between lower educational level and hesitancy.^[16] The manifested case was different in this study; educational levels were not related to hesitancy.

Among the children who have not received the influenza vaccine in our study, the most common reason was the parental belief that the vaccine is unnecessary. The second most common reason was the lack of doctor's recommendation, and the third was concern about the vaccine. In the Turkish study, the main reasons for refusing the influenza vaccine included the belief that there is no need for it and is not considered useful.^[17] A study that took place in South India to assess parental attitudes toward childhood influenza vaccination found that lack of recommendation by a doctor was the most common reason for parents choosing that their children did not receive influenza vaccination.^[5] Likewise, the Singaporean study concluded that the key to improving influenza vaccine uptake would be encouraging medical professionals to recommend the vaccine.^[7]

It is important to mention that primary care physicians take a substantial part in advocacy and provision of vaccines in all age groups.^[22] As in a study that was conducted on South Australian parents, a general practitioner recommendation had the highest influence towards receiving influenza vaccine in the future (63.8%). The authors advised that health care providers especially general practitioners and pediatric specialists should take every chance to talk to the parents about influenza vaccine.^[23]

To summarize our findings, the attitude of parents towards seasonal influenza vaccination in children, for the most part, was positive in Saudi Arabia. The only demographic factors associated with significant hesitancy were the male gender of the parent and the parental age (≥ 50 years). Mothers in general and the parents of younger age (< 50 years) were more permissive and less hesitant. The rate of vaccine administration was low. The most common reason for non adherence to inoculation was the belief that the vaccine is not necessary.

Study Limitations

Limitations to our study include the setting being Family Medicine clinics in a single city in the country. Furthermore, sampling bias may have been brought in by the convenience sampling technique.

Conclusion

Despite the low parental hesitancy towards the influenza vaccine in Saudi Arabia, the administration rate in children was low. The most common reason for not receiving the vaccine was the belief that the vaccine is not necessary. It is advisable to apply prudent interventions and corrective measures for enhancing the compliance and acceptance of the flu vaccine such as recommendation by the doctor, education, and awareness regarding the significance of seasonal influenza vaccination, and alleviation of myths and misconceptions about the vaccine. In addition, establishing national guidelines, public service announcements, optimal utilization of social media, and public health awareness campaigns can help change these perceptions and increase vaccination uptake in the country.

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Conflicts of interest

There are no conflicts of interest.

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