

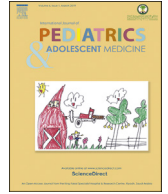
HOSTED BY



ELSEVIER

Contents lists available at ScienceDirect

# International Journal of Pediatrics and Adolescent Medicine

journal homepage: <http://www.elsevier.com/locate/ijpam>

## Original article

# Knowledge, attitudes, and practice of healthcare workers toward influenza vaccination at Al Jalila Children's Specialty Hospital (AJCH), Dubai, UAE

Walid Abu Hammour<sup>a,\*</sup>, Samar Al-Saleh<sup>b</sup><sup>a</sup> Pediatric Infectious Disease Department, Al Jalila Children's Specialty Hospital AJCH, Dubai, United Arab Emirates<sup>b</sup> Research Department, Al Jalila Children's Specialty Hospital AJCH, Dubai, United Arab Emirates

## ARTICLE INFO

### Article history:

Received 25 September 2018

Received in revised form

15 December 2018

Accepted 6 January 2019

Available online 22 January 2019

### Keywords:

Influenza vaccine

Knowledge

Attitudes

Practice

Healthcare workers

## ABSTRACT

**Background:** Influenza viruses usually circulate worldwide annually from the late fall through the early spring. Although most people with influenza recover without sequelae, it can cause serious illness and death, particularly among older adults, very young children, pregnant women, and those with certain chronic medical conditions.

**Aim of the study:** To describe the knowledge, attitudes, and practice of Al Jalila Children's Specialty Hospital healthcare workers toward influenza vaccination during 2016–2017 and understand their relative importance in promoting influenza vaccine uptake.

**Method:** A validated survey self-administered questionnaire was distributed to healthcare workers at AJCH. A descriptive analysis was performed, including an evaluation of associations using the chi-square test, and an alpha level of 0.05 was considered significant.

**Results:** The questionnaire was distributed to 350 healthcare workers, and 263 (76%) of them completed the survey. Among the responders, 63% answered that they were not vaccinated for seasonal flu in both years, 32% answered that they were vaccinated once, in either 2016 or 2017, and only 5% answered that they were vaccinated during both years.

The analysis of results by gender indicates that influenza vaccination uptake in both years (2016 and 2017) was more common in females than in males.

Despite a higher educational level, influenza vaccination remained low among physician, nurses, and postgraduate workers.

**Conclusion:** The healthcare workers' knowledge of influenza disease does not reflect their knowledge, attitude, and practice toward influenza vaccination. These results highlight the important predictors that must be targeted to promote hospital awareness campaigns to improve their practice and attitude, which could result in increasing seasonal influenza vaccine uptake.

© 2019 Publishing services provided by Elsevier B.V. on behalf of King Faisal Specialist Hospital & Research Centre (General Organization), Saudi Arabia. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## 1. Background

Influenza is a major public health challenge. The influenza vaccine is the best effective measure to prevent the infection [1]. Since 1984, it has been routinely recommended to healthcare workers to prevent infection in patients and healthcare workers [2,3], and

despite the recommendation for annual influenza vaccine, vaccine uptake by the staff remains low. The aim of this study is to describe the knowledge, attitude, and practice of Al Jalila Children's Specialty Hospital (AJCH) healthcare workers toward seasonal influenza vaccination during 2016–2017 and to understand their relative importance in promoting influenza vaccine uptake.

## 2. Methods

The seasonal influenza vaccine is offered annually to healthcare workers at Al Jalila Children's Hospital. A validated survey self-

\* Corresponding author.

E-mail address: [wabuhammour@yahoo.com](mailto:wabuhammour@yahoo.com) (W. Abu Hammour).

Peer review under responsibility of King Faisal Specialist Hospital & Research Centre (General Organization), Saudi Arabia.

administered questionnaire was distributed to the staff. The questionnaire consisted of questions regarding socio-demographic characteristics, vaccination status, and knowledge, attitudes, and practice toward influenza vaccination among healthcare workers. A descriptive analysis was performed, including an evaluation of associations using the chi-square test, and an alpha level of 0.05 was considered significant.

### 3. Study design

To answer the proposed research questions, as described in other publications [4,5], the study conducted a validated self-administered survey among all healthcare workers at AJCH. Participation was anonymous and voluntary. By convention, consent was considered implicit if the subject completed the survey.

### 4. Setting

The study sample comprised physicians, nurses, healthcare assistants, and nonhealthcare workers of Al Jalila Children's Specialty Hospital in Dubai, and they were recruited between 15 April 2018 and 15 August 2018 with a target number of 400 participants.

The questionnaire was divided into three sections:

#### 4.1. Section A

This section includes socio-demographic characteristics, the degree of qualification, occupational category, and origin, with a question about how often they should get the influenza vaccine.

#### 4.2. Section B

In this section, participants who lived with people at high risk of acquiring the influenza infection (based on the following categories) were asked to answer yes or no to the following list of questions:

- a. Children less than 9 years old
- b. People more than 65 years old
- c. People with chronic illness
- d. People with chronic cardiovascular disease
- e. People with chronic respiratory disease
- f. People with chronic renal failure
- g. People with autoimmune diseases
- h. People with diabetes
- i. People with respiratory infections that occurred in the previous years
- j. Health status self-perceived: poor, fair, and good

#### 4.3. Section C

This section includes participants' agreement (totally agree, partially agree, partially disagree, or totally disagree) with a factual

question about influenza and influenza vaccine.

This section includes questions on previous influenza vaccination status of participants against seasonal influenza in 2016 and 2017 as three categories: always vaccinated (in both 2016 and 2017), sometimes vaccinated (once, in either 2016 or 2017), and never vaccinated (not vaccinated in both 2016 and 2017).

#### 1. Sampling and sample size:

The questionnaire was distributed to 350 healthcare workers during the study duration by staff nurses who were trained for the study purposed to decrease the bias.

#### 2. Data analysis:

The collected data were coded and entered into IBM SPSS Statistics 20, and statistical analysis was performed. Descriptive analysis was used to measure percentage, means, and ranges and evaluate the association using the chi-square test. The hypothesis test considered an alpha level of 0.05 as significant.

#### 3. Outcomes:

The first outcome was knowledge of influenza, vaccination, and vaccination status among healthcare workers. The second outcome was their attitudes and practice toward influenza vaccination.

### 5. Ethics and confidentiality

The Research Ethics Committee at Dubai Health Authority in September 2017 approved the study protocol. The study was conducted following the ethical standards outlined in the World Medical Association Declaration of Helsinki guideline [6].

Participation in this study is anonymous, and questionnaires did not include respondents' names. All completed questionnaires along with other study documentation were stored in a locked cabinet. When the study was completed, the forms were securely stored for 5 years and then destroyed. Consent was considered implicit on voluntary completion of the questionnaire.

### 6. Results

#### 6.1. Descriptive analysis

A total of 263 (76%) out of 350 questionnaires were completed. With regard to the frequency of vaccination, as shown in Table 1, 63% of the employees answered that they were never vaccinated in both 2016 and 2017; 32% answered that they were sometimes vaccinated, which means they had been vaccinated in either 2016 or 2017; and only 5% answered that they were always vaccinated in both 2016 and 2017.

The chi-square test was used to analyze factors that might affect the vaccination uptake among AJCH employees during 2016 and 2017 using a *P* value less than or equal to 0.05 (Table 2).

**Table 1**

Frequency: In the past two years, when did you take influenza vaccination?.

|         |                                                     | Frequency | Percent | Valid Percent | Cumulative Percent |
|---------|-----------------------------------------------------|-----------|---------|---------------|--------------------|
| Valid   | Never vaccinated (neither in 2016 nor in 2017)      | 163       | 62.0    | 62.5          | 62.5               |
|         | Sometimes vaccinated (once, in either 2016 or 2017) | 85        | 32.3    | 32.6          | 95.0               |
|         | Always vaccinated (in both 2016 and 2017)           | 13        | 4.9     | 5.0           | 100.0              |
|         | Total                                               | 261       | 99.2    | 100.0         |                    |
| Missing | System                                              | 2         | 0.8     |               |                    |
| Total   |                                                     | 263       | 100.0   |               |                    |

**Table 2**  
Seasonal influenza vaccination coverage during 2016 and 2017.

| Variables                                                              | Total number = 263<br>N (%) | Never vaccinated<br>N = 161 (62%) | Vaccinated<br>N = 83 (32.3%) | Always vaccinated<br>N = 13 (5.1%) | Significance<br>P value > .05 |
|------------------------------------------------------------------------|-----------------------------|-----------------------------------|------------------------------|------------------------------------|-------------------------------|
| Gender                                                                 |                             |                                   |                              |                                    |                               |
| Male                                                                   | 9 (37.6)                    | 73 (28.3)                         | 20 (7.8)                     | 4 (1.6)                            | .010                          |
| Female                                                                 | 161 (62.4)                  | 88 (55)                           | 63 (39.4)                    | 9 (5.9)                            | .010                          |
| Age range, years                                                       |                             |                                   |                              |                                    |                               |
| 18–24                                                                  | 21 (8.0)                    | 0 (0.0)                           | 0 (0.0)                      | 0 (0.0)                            | .000                          |
| 25–34                                                                  | 157 (59.9)                  | 96 (36.6)                         | 54 (20.6)                    | 6 (2.3)                            | .000                          |
| 35–44                                                                  | 35 (13.4)                   | 35 (13.4)                         | 25 (9.5)                     | 5 (1.9)                            | .000                          |
| 45–55                                                                  | 12 (4.6)                    | 8 (3.1)                           | 4 (1.5)                      | 0 (0.0)                            | .000                          |
| 55+                                                                    | 3 (1.1)                     | 1 (0.4)                           | 0 (0.0)                      | 2 (0.8)                            | .000                          |
| Educational qualification                                              |                             |                                   |                              |                                    |                               |
| Elementary school                                                      | 1 (0.4)                     | 0 (0.0)                           | 0 (0.0)                      | 0 (0.0)                            | .001                          |
| Middle school                                                          | 17 (6.5)                    | 0 (0.0)                           | 0 (0.0)                      | 0 (0.0)                            | .001                          |
| High school                                                            | 32 (12.2)                   | 27 (10.3)                         | 2 (0.8)                      | 3 (1.1)                            | .001                          |
| University degree                                                      | 149 (56.9)                  | 76 (29)                           | 66 (25.2)                    | 6 (2.3)                            | .001                          |
| Postgraduate                                                           | 55 (21)                     | 34 (13)                           | 17 (6.5)                     | 4 (1.5)                            | .001                          |
| Occupational category                                                  |                             |                                   |                              |                                    |                               |
| Physician                                                              | 31 (11.8)                   | 18 (6.9)                          | 9 (34)                       | 4 (1.5)                            | .000                          |
| Nurse                                                                  | 89 (34)                     | 32 (12.2)                         | 51 (19.5)                    | 5 (1.9)                            | .00                           |
| Healthcare assistant                                                   | 17 (6.5)                    | 12 (4.6)                          | 3 (1.1)                      | 2 (0.8)                            | .000                          |
| Student                                                                | 1 (0.4)                     | 0 (0.0)                           | 0 (0.0)                      | 0 (0.0)                            | .000                          |
| Other nonhealthcare workers                                            | 94 (35.9)                   | 82 (31.35)                        | 11 (4.2)                     | 1 (0.4)                            | .000                          |
| Other healthcare workers                                               | 30 (11.5)                   | 18 (6.9)                          | 11 (4.2)                     | 1 (0.4)                            | .000                          |
| Nationality                                                            |                             |                                   |                              |                                    |                               |
| UAE                                                                    | 11 (4.2)                    | 9 (3.4)                           | 2 (0.8)                      | 0 (0.0)                            | .564                          |
| Expatriate                                                             | 251 (95.8)                  | 154 (58.8)                        | 83 (31.7)                    | 13 (5.0)                           | .564                          |
| Do you live with people at high risk of receiving the influenza virus? |                             |                                   |                              |                                    |                               |
| <9 years old in household                                              | 72 (27.5)                   | 38 (14.5)                         | 31 (1.8)                     | 3 (1.1)                            | .146                          |
| - Yes                                                                  |                             |                                   |                              |                                    |                               |
| >65 years old in household                                             | 22 (8.4)                    | 13 (5.0)                          | 7 (2.7)                      | 1 (0.4)                            | .012                          |
| - Yes                                                                  |                             |                                   |                              |                                    |                               |
| People with chronic illness in household                               | 11 (4.2)                    | 8 (3.1)                           | 3 (1.1)                      | 0 (0.0)                            | .822                          |
| - Yes                                                                  |                             |                                   |                              |                                    |                               |
| Chronic cardiovascular disease                                         | 16 (6.1)                    | 11 (4.2)                          | 5 (1.9)                      | 0 (0.0)                            | .793                          |
| - Yes                                                                  |                             |                                   |                              |                                    |                               |
| Chronic respiratory disease                                            | 9 (3.4)                     | 7 (2.7)                           | 2 (0.8)                      | 0 (0.0)                            | .762                          |
| - Yes                                                                  |                             |                                   |                              |                                    |                               |
| Chronic kidney-related disease                                         | 6 (2.3)                     | 1 (0.4)                           | 4 (1.5)                      | 1 (0.4)                            | .112                          |
| - Yes                                                                  |                             |                                   |                              |                                    |                               |
| Diabetes                                                               | 19 (7.3)                    | 9 (3.4)                           | 8 (3.1)                      | 2 (0.8)                            | .445                          |
| - Yes                                                                  |                             |                                   |                              |                                    |                               |
| Autoimmune disease                                                     | 6 (2.3)                     | 2 (0.8)                           | 4 (1.5)                      | 0 (0.0)                            | .338                          |
| - Yes                                                                  |                             |                                   |                              |                                    |                               |
| Respiratory infection in the previous year                             | 35 (13.4)                   | 24 (9.2)                          | 4 (1.5)                      | 0 (0.0)                            | .563                          |
| - Yes                                                                  |                             |                                   |                              |                                    |                               |
| What is your health status (self-perceived)?                           |                             |                                   |                              |                                    |                               |
| - Not good (1–5)                                                       | 2 (0.8)                     | 0 (0.0)                           | 2 (0.8)                      | 0 (0.0)                            | .241                          |
| What is your health status (self-perceived)?                           |                             |                                   |                              |                                    |                               |
| - Good (5–10)                                                          | 260 (99.2)                  | 163 (62.2)                        | 83 (31.7)                    | 13 (5.0)                           | .241                          |

The analysis of results by gender was significant, and the *p*-value was .01 (less than .05; Table 2); the number of workers who were never vaccinated in both years was more in males than in females (73% vs. 55%, respectively), whereas, the number of workers who were always vaccinated in both years was more in females than in males (5.6% vs. 4.1%, respectively).

The age group analysis result showed significance; workers who were always vaccinated were mostly in the middle age group, i.e., 25–34 and 35–44 years (46% and 38%, respectively).

For the educational qualification category, the result showed the tendency for always vaccinated or sometimes vaccinated with increase in the educational level in university degree and postgraduate degree; however, there was an exception for the school level, as the number of participants was much less than that in the graduate level. Moreover, among graduates, workers who were never vaccinated were more (29%) than those who were sometimes vaccinated (25.2%) and always vaccinated (2.3%).

Among all occupational categories, nonclinical healthcare workers comprised the highest proportion of not being vaccinated,

whereas nurses were always vaccinated compared to the other groups.

Living with people at high risk of acquiring the influenza virus does not influence vaccination uptake; the analysis did not show significance for chronic illness, people living with children at risk of acquiring the virus, autoimmune diseases, respiratory diseases, cardiovascular diseases, diabetes, and chronic kidney diseases; however, for living with elderly at risk of acquiring influenza disease, vaccination had a significant effect on receiving the vaccination.

## 6.2. Knowledge, attitude, and practice toward influenza virus and influenza vaccine

A Likert scale was used to assess the knowledge of influenza virus and vaccination. Statements about the participants' agreement or disagreement toward the virus and vaccination were analyzed to compare them with the three vaccination statuses that have been identified previously. Fig. 1 illustrates that workers in all

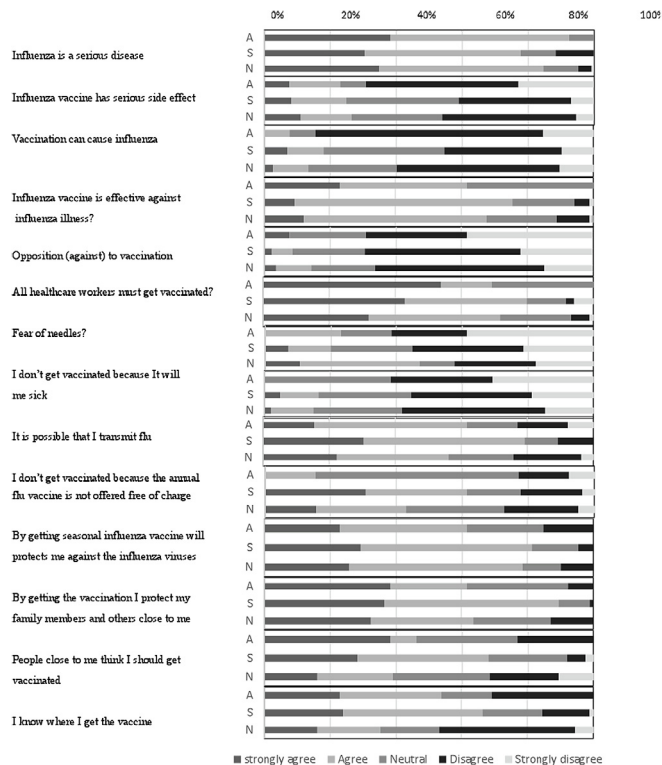


Fig. 1. Frequency analysis stratified by respondents' KAP towards influenza virus and influenza vaccine.

the three categories strongly agreed that influenza is a serious health problem and disagreed that it has a serious side effect.

Moreover, workers in all the three categories mostly disagreed that vaccination can cause influenza; however, approximately an equal number of workers in the never vaccinated and sometimes vaccinated groups were neutral about the two statements: vaccination has a serious side effect and vaccination can cause influenza.

Regarding the effectiveness of the vaccination, the percentage of agreement was high for all the categories.

Workers in all the three categories were not against influenza vaccination; on the other hand, there was no significant difference with regard to the fear of needle.

Furthermore, 54% of them in the never vaccinated and 40% of them in the sometimes vaccinated groups mostly agreed that the vaccine can possibly transmit flu.

The never vaccinated and sometimes vaccinated groups did not receive influenza vaccine because it was not offered free of charge, and the always vaccinated group (61.5%) was neutral about this statement. Most of the respondents knew where to obtain the vaccine; however, 50% of them in the never vaccinated group did not know where to obtain from the vaccine.

More than 75% of them in the three groups believed that influenza vaccination protected them and their families against influenza virus. Therefore, self-protection and family members' protection can be considered as a motivational factor in the future.

## 7. Discussion

The analysis of the study survey showed that despite the practice toward vaccination (the never vaccinated and sometimes vaccinated categories), the participants believed that the vaccination was effective against the virus and they considered influenza as a serious illness.

We focused on the history and continuity of vaccination over the past 2 years, which can be a reliable predictor of the future vaccination; we found that vaccination uptake was more among females than among males and higher with more educational background.

For workers' attitude, we focused on motivation toward vaccination uptake, vesting the belief that the effectiveness of the vaccine for self-protection and family members' protection can be a motivating factor driving for vaccine acceptance.

The knowledge of the influenza virus and the importance of flu vaccination was lower in the never vaccinated group than in the sometimes vaccinated and always vaccinated groups. Physicians and nurses had more tendency for vaccine uptake; therefore, it is very important to increase the awareness among healthcare and nonhealthcare workers in the workplace to increase health insurance vaccination coverage.

Furthermore, this study considered the possible barriers to influenza vaccination, 50% of the never vaccinated did not know where to obtain the vaccinations. Regarding the health knowledge of the health insurance vaccination coverage, 67.2% of the participants did not know whether vaccination was covered under insurance or not; thus, this would be an acceptable reason why they are not receiving the vaccine. According to the Centers for Disease Control and Prevention (CDC), flu vaccination coverage among adults during 2017–2018 was 37.1%, and a decrease of 6.2% points from 2016 to 2017 among all age groups and in most states was noted [7]. A relatively low percentage of the participants had been vaccinated with the seasonal influenza vaccine. Our findings regarding vaccination rates among healthcare workers were consistent with those reported elsewhere [8,9]. Therefore, understanding the factors that improve the acceptance of vaccination is crucial to design effective public health interventions.

## 8. Conclusion

The input of this study offers the opportunity to focus on the future needs to improve the vaccination status. Moreover, it highlights the importance of educating the staff about the influenza virus and vaccination. In conclusion, developing and implementing strategies to increase the awareness of staff about influenza vaccine, improving the availability of vaccination, and using comparable strategies may increase vaccination rate among healthcare workers.

## Conflict of interest

There is no conflict of interest.

## Acknowledgment

Acknowledgment to Krystell H. Salabsalo for her valuable time and assistance during the survey phase.

## References

- [1] WHO. Influenza (seasonal). Fact Sheet no 211 [Internet]. World Health Organization Media Center; 2014. p. 1–4. Available from: [http://www.who.int/en/news-room/fact-sheets/detail/influenza-\(seasonal\)](http://www.who.int/en/news-room/fact-sheets/detail/influenza-(seasonal)).
- [2] Acip IP. Immunization of Health-Care Personnel Recommendations of the Advisory Committee on. In: Cont Educ; 2011.
- [3] Babcock HM, Gemeinhart N, Jones M, Dunagan WC, Woeltje KF. Mandatory influenza vaccination of health care workers: Translating policy to practice. *Clin Infect Dis* 2010;50:459–64.
- [4] Bonaccorsi G, Santomauro F, Porchia B, Nicolai G, Pellegrino E, Bonanni P, et al. Beliefs and opinions of health care workers and students regarding influenza and influenza vaccination in Tuscany, Central Italy. In: *Vaccines*; 2015.
- [5] Mytton OT, O'Moore EM, Sparkes T, Baxi R, Abid M. *Occup Med (Lond)* 2013;63(3):189–95.
- [6] World Medical Association. World Medical Association Declaration of Helsinki:

- ethical principles for medical research involving human subjects. *Jama* 2013;310(20):2191–4.
- [7] <https://www.cdc.gov/flu/fluview/coverage-1718estimates.htm>.
- [8] Khan TM, Khan AU, Ali I, Wu DB-C. Knowledge, attitude and awareness among healthcare professionals about influenza vaccination in Peshawar, Pakistan. In: *Vaccine* 34; 2016. p. 1393–8. <https://doi.org/10.1016/j.vaccine.2016.01.045>.
- [9] Hiremath RN, Kotwal SA, Kunte R, Hiremath S, Basannar D, Bhalla S. Acceptance of vaccination against the 2009 pandemic influenza A among health-care workers in Pune, Maharashtra. *Indian J Publ Health* 2013;57:48. <https://doi.org/10.4103/0019-557X.111383>.