# PANDEMIC INFLUENZA: PERCEPTION OF MEDICAL STUDENTS MEDICAL COLLEGE. TAIBAH UNIVERSITY. MEDINA, SAUDI ARABIA 2009

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## ABSTRACT

***Background:*** *Healthcare workers (HCWs) play a key role in any response to pandemic influenza, and will be in the frontline of exposure to infection. Recent guidance suggests that up to 50% of the workforce may be absent from work at the peak of the pandemic because of caring responsibilities.*
***Objectives:*** *To identify the knowledge of the final year medical students about Pandemic Influenza; and to verify their attitude towards working during pandemic and getting the vaccine of H1N1.*
***Methods:*** *A cross sectional survey was conducted during November 2009. The study population included all final year medical students (69students) of both genders at the medical college, Taibah University, Medina, KSA. A precoded self-reported questionnaire was reported by the students. Quantitative data were presented as mean ± SD. For the comparison of the male and female groups' means, independent samples student t- test and chi-square test and linear regression were used. All tests were two tailed and considered significant when $p<0.05$.*
***Results:*** *The mean percent score for student's knowledge about H1N1 pandemic was low (59.9%±17.4), 72.5% refused vaccination against H1N1and 31.9% refused joining voluntary work during H1N1 pandemic. Gender, age, marital status and family number were predictors r voluntary work.*
***Conclusion:*** *Defective knowledge and the role of the family are the main factors predispose to further attitude of medical students regarding voluntary work and vaccination.*
***Key Words:*** *Pandemic Influenza, Influenza A Virus, H1N1 Subtype - Middle East, Saudi Arabia.*

**Abbreviation**:

- **NHS:** National Health Service
- **CME:** Continuous medical education
- **HCWs:** Health Care Workers

## INTRODUCTION

The World Health Organization WHO describes an influenza pandemic as an event in which "a new influenza virus appears against which the human population has no immunity, resulting in several, and simultaneous epidemics worldwide with enormous numbers of deaths and illness".[(1)] In Saudi Arabia especially and during Hajj period, it is expected that the cumulative number of cases will increase and also the case fatality rate under the reasonable worst case scenario.[(2)] These assumptions work on the basis of cumulative clinical attack rates of up to 50%; 4% of symptomatic patients requiring hospital admission; and a case fatality rate of 0.2-2.5%.[(2)] Even at the lower end of these estimates, an influenza pandemic will place the National Health Service (NHS) under severe strain, and it is clear from the recent National Risk Register[(3)] that it is regarded as a significant threat to national security.

Healthcare workers (HCWs) should play a key role in any response to pandemic influenza, and will be in the frontline of exposure to infection. Planning assumes that once a pandemic is confirmed, the NHS will "care for large numbers of cases, and will only provide essential care" for other patients.[(2)]

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Recent guidance, based on an (unreferenced) survey tool, suggests that up to 50% of the workforce may be absent from work at the peak of the pandemic because of caring responsibilities.[(3,4)] A modeling summary estimates staff absenteeism between 30-35% at the peak, taking into account the cumulative effect of staff illness, the need to look after ill children, and possible school closures.[(5)]

It may not, however, be reasonable to assume that HCWs will be *willing* to work even if they are *able* to do so. For instance, during the early years of the Human Immunodeficiency Virus (HIV) epidemic doctors debated whether it was ethically permissible to refuse to treat those with HIV;[(6-10)] and during the 2003 Severe Acute Respiratory Syndrome (SARS) outbreak some HCWs were not willing to treat SARS patients.[(11-13)] HIV and SARS provide reasonable comparators to pandemic influenza, and it is not unreasonable, therefore, to assume that the response to pandemic influenza may be similar.

The limited data on factors influencing HCWs' willingness to work or get the vaccine of H1N1 highlight a sense of professional obligation, estimated risk to oneself and ones' family and inclusion in preparedness planning[(14-16)] Ehrenstein and colleagues[(17)] found 28% of German HCWs (physicians, final year medical students, nurses and administrators) may abandon work in favour of protecting themselves and family. Qureshi and



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colleagues[18] found the most significant barrier to US HCWs' willingness to work was fear for their own and their family's health. A survey of clinical and non-clinical HCWs in the US estimated that up to 50% would be unwilling to work, with clinical staff more likely to attend than non-clinical.[19] Research from Singapore suggests that the risks posed to self and to family would be significant concerns for primary care physicians,[20] and a similar Australian study of general practitioners highlights a strong sense of obligation to work coexisting with concerns about being provided with protective equipment and the welfare of dependants.[16] It cannot be taken for granted that these studies can be applied to workers from other health services nor that the results of these studies can be used to inform their attempts to modify attitudes ahead of a pandemic. Different countries have different health care systems and different healthcare cultures. Given that healthcare culture is likely to have an impact upon the willingness of HCWs to work, it is important that culture specific research is conducted.

Emergency planning, and consequently patient care, will be improved if it is possible to establish the factors associated with HCWs' willingness to work, and identify the motivations HCWs have for continuing to work. This study, therefore, aimed to explore final year medical student's views about working and vaccination with H1N1 vaccine during an influenza pandemic, in order to identify factors that might influence their willingness and ability to work and potential sources of any perceived duty to work and vaccinate.

**Aim**

This study was carried out to identify the knowledge of final year medical students at Taibah University about Pandemic Influenza and verify their attitude for working during pandemic and for getting the vaccine of H1N1.

## METHODS

A cross sectional survey was conducted during November 2009. The study population included all final year medical students of both genders present at medical college, Taibah University, Medina, KSA; on the day of the study. No sampling was obtained as the medical college a small number of students (total 82) enrolled in the final year, out of them 69 joined the study (acceptance rate was 84.1%).

A precoded self-reported questionnaire was constructed and answered by the students themselves. The reliability of the questionnaire was assessed. The study tool was pre-tested on a random sample of 20 participants of both genders to ensure practicability, validity and interpretation of responses.

Ethics Review Committee reviewed and approved the research. It included the following; socio-demographic data, knowledge about pandemic influenza H1N1, attitude towards work during pandemic and attitude towards vaccination with H1N1 new vaccine. Each item of either knowledge or vaccination perception was scored as following: (0) for false knowledge or perception and (1) for true knowledge or perception, giving the score as following: for knowledge (0-10) and for perception (0-4).

**Statistical Analysis**

Statistical evaluation of all data was done on IBM-PC microprocessor computer using SPSS software for windows (Statistical Package for Social Sciences version 11.5, USA) for data management and analysis and the excel for figures. Quantitative data were presented as mean ± SD. For the comparison of the male and female groups' means, independent samples student t- test and chi-square test and linear regression were used. All tests were two tailed and considered significant when $p<0.05$.

## RESULTS

The mean age of students was 23.4±0.8 years and 81.2% were single. Only 15.4 % of married students had children below 5 and none of the married female students or wives of male one was pregnant at the time of the study. Majority of them live in separate houses (85.5%) with a mean family size of 6.2±2.6 persons and general crowding index of 1.4±0.8. [Table I]

Mean percent score for student's knowledge about H1N1 pandemic was 59.9%±17.4 with insignificant difference between males and females (p= 0.29). [Table II]

Regarding the opinion about perceptive of pandemic, about one third (31.9%) stated that it will decrease [males (39.4%) insignificantly higher than females (p= 0.43)], 29.0% stated that it will increase and 39.1% stated that it will remain the same [females (44.4%) insignificantly higher than males; (p=0.42)]. [Fig. 1].

Most of students did not receive annual flu shot (92.8%) with insignificant difference between both gender (p=0.13). Nearly three fourths (72.5%) refused vaccination against H1N1; with insignificant difference between both sexes (p=0.56). [Table 3] More than half of them (52.0%) stated that it is a mild illness and 44.0% was affected by media propaganda against vaccine. [Fig. 2]

Meanwhile, 63.2% accepted vaccination to avoid complications of illness. [Fig.3]

However, the mean percent score for vaccination perception was low (33.7%±14.1). [Table III]

One third of the students (31.9%) refused joining voluntary work during H1N1 pandemic for fear of

its communicability (54.5%), and difference between males and females was insignificant (p=0.07). Mean while 68.1% accept it, with insignificant difference between males and females (p=0.07). [Table IV]

Gender, age, marital status and family number were predictors for acceptance of voluntary work (p=0.04, 0.00, 0.00 and 0.02 respectively), while knowledge about pandemic was not a predictor (p=0.92). [Table V]

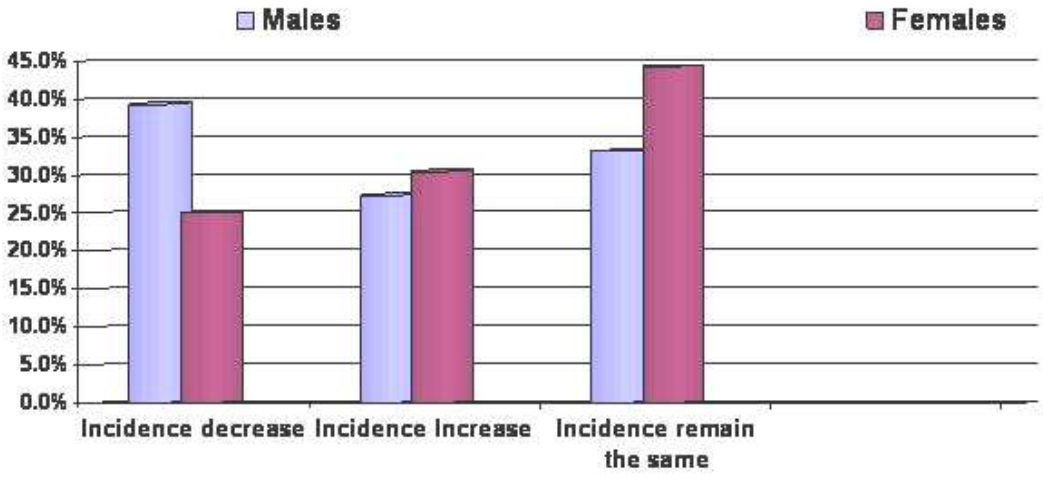


**Fig. 1:** Perspectives of medical Students about H1N1 Pandemic

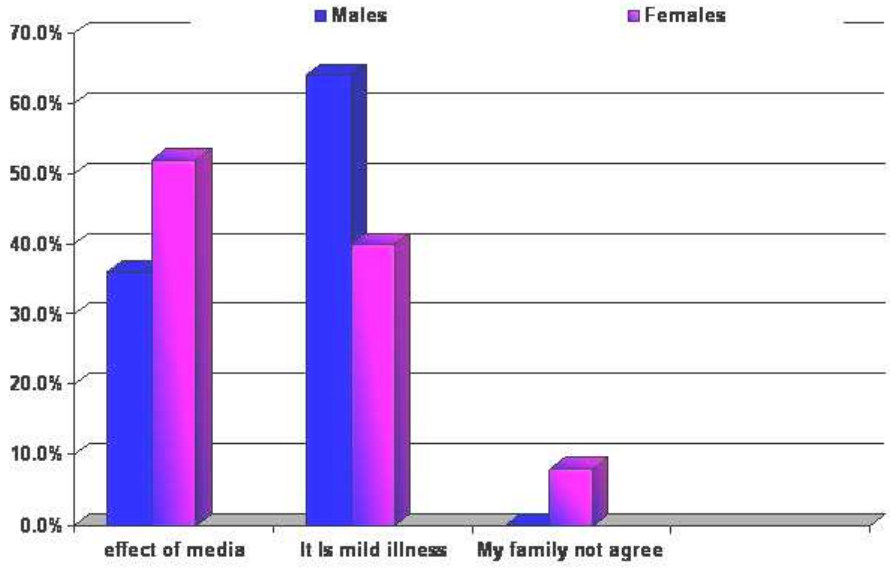


**Fig. 2:** Causes of refusal of H1N1 vaccine

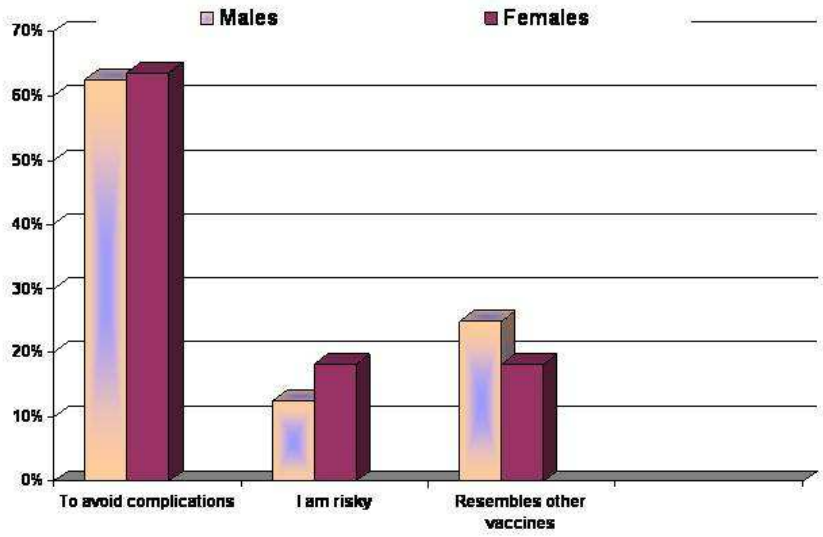


**Fig. 3:** Causes of acceptance of H1N1 vaccine

**Table I:** Description of the surveyed students

| | Male Students | | Female Students | | Total | | (P-value) |
|---|---|---|---|---|---|---|---|
| | N (33) | % | N (36) | % | N | % | |
| **Mean age in years** X ±SD | 23.7±7.7 | | 23.2±0.7 | | 23.4±0.8 | | 0.168 |
| **Marital Status** | | | | | | | |
| Single | 29 | 87.9 (51.8) | 27 | 75.0 (48.2) | 56 | 81.2 (100.0) | 0.17 |
| Married | 4 | 12.1 (30.8) | 9 | 25.0 (69.2) | 13 | 18.8 (100.0) | |
| **In case of ever married:** | | | | | | | |
| - No. of children < 5 years | | | | | | | |
| - No | 4 | 100.0 (36.4) | 7 | 77.8 (63.6) | 11 | 84.6 (100.0) | 0.59 |
| - Yes | 0 | 0.0 | 2 | 22.2 | 3 | 15.4 | |
| - Current pregnancy ( for female student or male spouse) | | | | | | | |
| -No | 4 (30.8) | 100.0 | 9 | 100.0 (69.2) | 13 | 100.0 (100.0) | -------- |
| -Yes | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | |
| **Mean Family size** X ±SD | 6.7±2.9 | | 5.7±2.1 | | 6.2±2.6 | | 0.07 |
| **Type of house** | | | | | | | |
| - Separate | 26 | 78.8 (44.1) | 33 | 91.7 (55.9) | 59 | 85.5 (100.0) | 0.1 |
| - Shared | 7 | 21.2 (70.0) | 3 | 8.3 (30.0) | 10 | 14.5 (100.0) | |
| **General Crowding Index** X ±SD | 1.3±0.7 | | 1.5±0.8 | | 1.4±0.8 | | 0.26 |
| **Family children <12 years** | 1.2±1.4 | | 1.1±1.3 | | 1.1±1.3 | | 0.68 |

*P-value as measured by $X^2$, significant at <0.05
**P-value as measured by student's test significant at <0.05

**Table II:** Students' general knowledge about H1N1 Pandemic

| | Male Students | | Female Students | | Total | | (P-value) |
|---|---|---|---|---|---|---|---|
| | N (33) | % | N (36) | % | N (69) | % | |
| **Severity** | | | | | | | |
| - False | 25 | 75.8 (44.6) | 31 | 86.1 (55.4) | 56 | 81.2 (100.0) | 0.27* |
| - True | 8 | 24.2 (61.5) | 5 | 13.9 (38.5) | 13 | 18.8 (100.0) | |
| **Age of occurrence** | | | | | | | |
| - False | 14 | 42.4 (48.3) | 15 | 41.7 (51.7) | 29 | 42.0 (100.0) | 0.94* |
| - True | 19 | 57.6 (47.5) | 21 | 58.3 (52.5) | 40 | 58.0 (100.0) | |
| **Clinical picture** | | | | | | | |
| - False | 15 | 45.5 (65.2) | 8 | 22.2 (34.8) | 23 | 33.3 (100.0) | **0.01*** |
| - True | 18 | 54.5 (39.1) | 28 | 77.8 (60.9) | 46 | 66.7 (100.0) | |
| **Complications** | | | | | | | |
| - False | 23 | 69.7 (42.6) | 31 | 86.1 (57.4) | 54 | 78.3 (100.0) | 0.09* |
| - True | 10 | 30.3 (66.7) | 5 | 13.9 (33.3) | 15 | 21.7 (100.0) | |
| **Agent** | | | | | | | |
| - False | 26 | 78.8 (49.1) | 27 | 75.0 (50.9) | 53 | 76.8 (100.0) | 0.71* |
| - True | 7 | 21.2 | 9 | 25.0 | 16 | 23.2 (100.0) | |
| **Mode of transmission** | | | | | | | |
| - False | 5 | 15.2 (71.4) | 2 | 5.6 (28.6) | 7 | 10.1 (100.0) | 0.19* |
| - True | 28 | 84.8 (45.2) | 34 | 94.4 (54.8) | 62 | 89.9 (100.0) | |
| **Susceptible group** | | | | | | | |
| - False | 0 | 0.0 (0.0) | 0 | 0.0 (0.0) | 0 | 0 (0.0) | ------ |
| - True | 33 | 100.0 (47.8) | 36 | 100.0 (52.2) | 69 | 100.0 (100.0) | |
| **Persons legible for vaccination** | | | | | | | |
| - False | 5 | 15.2 (21.7) | 18 | 50.0 (78.3) | 23 | 33.3 (100.0) | 0.00* |
| - True | 28 | 84.8 (60.9) | 18 | 50.0 (39.1) | 46 | 66.7 (100.0) | |
| **Preventive measures** | | | | | | | |
| - False | 4 | 12.1 (80.0) | 1 | 2.8 (20.0) | 5 | 7.2 (100.0) | 0.14* |
| - True | 29 | 87.9 (45.3) | 35 | 97.2 (54.7) | 64 | 92.8 (100.0) | |
| **Control measures** | | | | | | | |
| - False | 18 | 54.5 (60.0) | 12 | 33.3 (40.0) | 30 | 43.5 (100.0) | 0.08* |
| - True | 15 | 45.5 (38.5) | 24 | 66.7 (61.5) | 39 | 56.5 (100.0) | |
| **Mean percent score for Students' knowledge ±SD** | 60.0±18.9 | | 59.7±16.2 | | 59.9±17.4 | | 0.29** |

*P-value as measured by $X^2$, significant at <0.05

**P-value as measured by student's test significant at <0.05

**Table III:** Students' vaccination Perception

| | Male Students | | Female Students | | Total | | (P-value) |
|---|---|---|---|---|---|---|---|
| | N (33) | % | N (36) | % | N (69) | % | |
| **Annual vaccination against seasonal flu** | | | | | | | |
| - No | 29 | 87.9 (45.3) | 35 | 97.2 (54.7) | 64 | 92.8 (100.0) | 0.13* |
| - Yes | 4 | 12.1 | 1 | 2.8 | 5 | 7.2 (100.00) | |
| **Acceptance to receive H1N1 vaccine** | | | | | | | |
| - No | 25 | 75.8 (50.0) | 25 | 69.4 (50.0) | 50 | 72.5 (100.0) | 0.56* |
| - Yes | 8 | 24.2 | 11 | 30.6 | 19 | 27.5 (100.0) | |
| **Mean Percent Score for vaccination perception ± SD** | 34.1±15.1 | | 33.3±13.4 | | 33.7±14.1 | | 0.83** |

* P-value as measured by $X^2$, significant at <0.05

**P-value as measured by student's test significant at <0.05

**Table IV:** Perception of studied students regarding voluntary work

| | Male Students | | Female Students | | Total | | (P-value) |
|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | |
| **Acceptance of voluntary work** | | | | | | | |
| - No | 7 | 21.2 (31.8) | 15 | 41.7 (68.2) | 22 | 31.9 (100.0) | 0.07 |
| - Yes | 26 | 78.8 (55.3) | 21 | 58.3 (44.7) | 47 | 68.1 (100.0) | |
| **Causes of refusal** | | | | | | | |
| - Fear of communicability | 3 | 42.9 (25.0) | 9 | 60.0 (75.0) | 12 | 54.5 (100.0) | |
| - Refusal of family | 1 | 14.2 (14.3) | 6 | 40.0 (85.7) | 7 | 31.8 (100.0) | 0.07 |
| - Fear of exhaustion | 3 | 42.9 (100.0) | 0 | 0.0 (0.0) | 3 | 13.7 (100.0) | |
| **Causes of acceptance** | | | | | | | |
| - Help my people | 5 | 19.2 (50.0) | 5 | 23.8 (50.0) | 10 | 21.3 (100.0) | |
| - Get Experience | 3 | 11.5 (30.0) | 7 | 33.3 (70.0) | 10 | 21.3 (100.0) | 0.06 |
| - Both | 18 | 69.3 (66.7) | 9 | 42.9 (33.3) | 27 | 57.4 (100.0) | |
| **Preferred voluntary work** | | | | | | | |
| - Emergency | 7 | 26.9 (77.8) | 2 | 9.5 (22.2) | 9 | 19.1 (100.0) | |
| - Health education | 6 | 23.1 (85.7) | 1 | 4.8 (14.3) | 7 | 14.9 (100.0) | 0.06 |
| - Vaccination | 1 | 3.8 (25.0) | 3 | 14.3 (75.0) | 4 | 8.5 (100.0) | |
| - Any type of work | 12 | 46.2 (44.4) | 15 | 71.4 (55.6) | 27 | 57.5 (100.0) | |

P-value as measured by $X^2$, significant at <0.05

**Table V:** Predictors for Acceptance of Voluntary work

| Variable | SE | Beta | t | Significance |
|---|---|---|---|---|
| Gender | .2 | .4 | 2.1 | **0.04** |
| Age | .1 | .2 | 1.6 | **0.00** |
| Marital Status | .1 | .4 | 3.1 | **0.00** |
| Family Number | .0 | .1 | 2.5 | **0.02** |
| **R square** | | | 14.9 | |
| **F** | | | 3.3 | |
| Knowledge about pandemic | 4.5 | .5 | .1 | 0.92 |
| **R square** | | | 13.9 | |
| **F** | | | 1.0 | |

## DISCUSSION

Continuous monitoring of barriers that prevent HCWs from attendance to work during pandemic is an important issue for health planners who should prepare manpower for such emergencies.(1)

This study aimed at identifying knowledge of the final year medical students, medical college, Taibah University, Medina, Saudi Arabia, regarding H1N1 pandemic, attitude towards both working during pandemic and obtaining H1N1 vaccine. A cross sectional survey was conducted using specially designed format including all students.

Medical students must be emphasized during their entire education years upon the importance of continuous medical education (CME) and updating their knowledge regarding every emerging or re-emerging disease.(21)

Gaining new medical knowledge depends on habits of the mind: skepticism, tolerance of ambiguity, openness to new ideas, intellectual honesty, curiosity, and communication. Whenever students gain knowledge about new H1N1 pandemic; however, when unconvinced, they become skeptical.(22)

Knowledge of studied medical students about H1N1 pandemic (59.9%±17.4) denoting that there is a deficiency in their CME process and there is a great need to improve it.

Their poor knowledge has an impact not only on their perspectives towards the disease but also towards their attitude towards vaccination; where majority of them (72.5%) refused it, and mean percent score for vaccination perception was 33.7%±14.1; which definitely in turn will influence their families' perception as well.

The effect of media is of great importance on dissemination of information and modification of human behavior.(23) Medical students as humans affected by media's ideas about H1N1 vaccine to the degree that 44% of those refusing the vaccine attribute their refusal to media effect. As future physicians' they have to learn that they must deal with and accept only scientific facts; not with feelings or media.(24)

Young physicians are supposed to be active, have curiosity and generous ability to gain knowledge and training.(25-26) Nevertheless, this is not the case for 31.9% of the studied students; which reflects their reluctant attitude that need to be changed immediately.

In this study, predictors for voluntary work (demographic factors) were the same as other researches throughout the world.(25-33) This highlights the crucial role of community in influencing persons' type of work, even the physician.

The current knowledge and attitude of medical students may also be explained by defective role of their medical college in arranging conferences; specially hold for students; about new vivid important medical topics in the world and community, to give them scientific knowledge, changing their attitude and motivate them for further research and medical education.

### Study Limitation

The main limitation in this study was the students who were chosen from college of Medicine, Taibah University only and it would be extended to involve other students in other Saudi medical colleges. Another limitation was the tool of data collection, it was appropriate in such a study to use in depth focus group discussion, but there were many barriers that prevent meeting with those students during that period in addition this method expected to be associated with low response rate.

### Conclusion and Recommendation

Defective knowledge and the role of the family are the main factors predispose to further attitude of medical students regarding voluntary work as well as vaccination.

Health education about pandemic is mandatory and stress upon the important role of physician in the community in influencing community in general and family in particular is essential to have positive health attitude.

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